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AXIOMATIC MEASUREMENT OF SIMPLICITY *

1. SIMPLICITY AND MEASUREMENT

NO longer do we need to take seriously the idea that simplicity is something to be sought only if there is time after truth has been attained. To seek truth is to seek a true system, and to seek system at all is to seek simplicity. And considerations of simplicity are inextricably involved in the selection of what is regarded as a true system.

But despair has tended to replace disdain. Since—the argument runs—the notion of simplicity is vague, ambiguous, variable, and subjective, simplicity cannot be measured. The same argument might have been used a few thousand years ago against the possibility of measuring length; for in ordinary use "length" (or its ancient equivalent) is a highly vague and ambiguous term, the length of objects is always changing, and judgments of length are affected by innumerable subjective factors. I submit that there is no objection in principle against the measurability of simplicity that might not have been urged against the measurability of length.

In several earlier publications,[1] I have described a way of measuring one aspect of simplicity: the structural simplicity of the set of primitives constituting the extralogical basis of a system. But later discoveries, both of needed repairs and of worthwhile improvements, call for a complete restatement here. The point of departure remains the same, and many of the evaluations and formulas are unchanged. But the underlying principles are now much more fully displayed through an explicit axiomatization; and much more adequate account is taken of certain complicated factors affecting the evaluation of predicates of more than two places. As a matter of fact, many of the difficulties encountered

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[1] The most recent are "New Notes on Simplicity," *Journal of Symbolic Logic*, vol. 17 (1952), pp. 189–191, and my book *The Structure of Appearance* (Harvard University Press, 1951), pp. 59–85. The free use of platonistic language in the present paper constitutes only a temporary departure from nominalism, enforced by limitations of space and time.

in arriving at a satisfactory method of evaluation have arisen less from any root question about simplicity itself than from the rapid multiplication of relevant properties as the number of predicate places increases.

2. The Basic Postulates

The first crucial step towards measuring length was surely not to canvas all the tangled and variable uses of the term "length." Rather it was to fix on a single elementary clue—the operation of applying a yardstick in a certain way—that would lead to an apt and integrated system.

Our clue is to be found, I think, in the reason often given when a claimed simplification is rejected as spurious. Why is no real economy achieved if we replace a basis B_1, consisting of two one-place predicates, by another basis B_2, consisting of one two-place predicate? "Because," we are inclined to answer, "that can always be done." In effect, we are saying that a replacement of a sort that can always be accomplished effects no genuine simplification.

This provides us with our first postulate:

P1. *If every basis of a relevant kind K is always replaceable by some basis of a relevant kind L, then K is not more complex than L (i.e., K does not have a higher complexity-value than L*— or, using obvious abbreviations, $vK \leq vL$).

Now a good many points here call for explanation. In the first place, to say that every basis of kind K is *always replaceable by* some basis of kind L, is to say not only that there always is some equivalent basis of kind L, but also that we can always find one; that is, that given any basis B of kind K, with no further information than that B is of kind K, we can define in terms of B and logic alone some basis B' of kind L such that we can redefine B from B' and logic alone. The replacement must not, for example, depend upon any existential assumption beyond the usual logical one of a non-empty universe. Our postulate is thus weaker than it would be with "equivalent to" put in for "always replaceable by." It should be remarked that the systems under consideration in this paper have as their logical apparatus just the truth-functional connectives, the quantifiers, and the identity-sign, and as their extralogical bases sets of one or more predicates of individuals. Extensions of the theory to predicates of higher type can be carried out by the method of correlation I have described elsewhere.[2]

[2] *The Structure of Appearance*, pp. 75–85.

In the second place, our postulate speaks of the complexity of kinds rather than of bases. A kind has the highest complexity-value possessed by any basis of that kind. It thus follows, for example, that if K is a kind included in a broader kind L, then $vK \leq vL$; and if $vK < vL$ here, then vL is equal to the value of the kind of basis that belongs to L but not K. A given basis has the complexity value of the narrowest relevant kind to which the basis belongs.

In the third place, what are the relevant kinds? The outline of the crucial distinction between these and other, non-relevant, classes of bases is to be discerned in the way the principle underlying the postulate is actually applied. Roughly, a relevant kind of predicate is defined by any combination of the properties most commonly used in classifying predicates: number of places, and status with respect to reflexivity, symmetry, and transitivity; and a relevant kind of basis is defined by the number and kinds of predicates in each basis. But as it stands, this is too casual and imprecise to serve the purposes of a general and exact system of measurement, and a good part of our task will be to provide, as we go along, a more systematic specification of what are to be taken as the relevant kinds. For the moment only the following incidental but useful principles need be stated: the logical sum of any two relevant kinds, and likewise the logical product of any two intersecting relevant kinds, is a relevant kind; and so also is the class of bases that belong to one relevant kind but not to a second, smaller kind.

Supplementing the first and major postulate is a second that requires less discussion:

P2. *Every predicate in an extralogical basis has a positive complexity value, and the value of the basis is the sum of the values of the predicates in it.*

Since we are measuring the complexity of extralogical bases, the logical apparatus has the value zero. The first clause of the postulate merely reflects the fact that each predicate in an extralogical basis is a primitive in addition to that logical apparatus. The second clause, in effect, stipulates that interconnections among the predicates in a basis are not factors admitted in the definition of relevant kinds.

Things will proceed much more easily if we adopt the working assumption that all bases in question consist solely of applicable predicates, i.e., predicates with non-null extensions. The values computed under this assumption will be unaffected by dropping it

afterwards; for since inapplicable predicates have the value zero, the class of applicable and inapplicable predicates of a given kind has the same value as the class of applicable predicates of that kind.

Except where a different interpretation is clearly indicated by the context, "class" and "kind" are herein always to be taken as referring to relevant kinds. And I shall use braces to abbreviate the description of relevant kinds of basis; e.g., "{n-pl.}" for "the kind of basis that consists of a single n-place predicate," and "{2-pl.; 1-pl}" for "the kind of basis that consists of a two-place and a one-place predicate."

Among the useful elementary theorems that can now be easily proved are:

T1. If every basis of kind K is always replaceable by some basis of kind L, and every basis of kind L is always replaceable by some basis of kind K, then $vK = vL$.

T2. If a basis B consists of some but not all the predicates of a basis B', then $vB < vB'$.

T3. $v\{n\text{-pl.}\} = v\{\text{not-more-than-}n\text{-pl.}\}$.

T4. $v\{n\ 1\text{-pl.}\} \leq v\{n\text{-pl.}\}$.

T5. If $n < m$, then $v\{n\text{-pl.}\} < v\{m\text{-pl.}\}$.

3. Reflexivity

Reflexivity is a complicated matter, but fortunately it can be dealt with pretty much in isolation. Let us begin with two-place predicates; one-place predicates may be considered as degenerately irreflexive.

A predicate is *redundant* if all its pairs[3] are identity pairs, *totally reflexive* if all identity pairs are pairs of the predicate, and *irreflexive* if none of its pairs are identity pairs.

The usual classification of predicates as reflexive and non-reflexive, however, gives way to others more to our purpose. Let α be the class of first components of the non-identity pairs of a predicate, β the class of second components of such pairs, and γ the class of components of the identity pairs of the predicate. The predicate is *left-reflexive* if α and γ are the same. Thus "— is a male citizen of the same country as ..." is left-reflexive; but "— is a son of the same parents as ..." is not, since a son who is an only child is a son of the same parents as no one but himself. Obviously a predicate is *right-reflexive* if β and γ are the same.

Where γ is the product of α and β, the predicate may be termed *meet-reflexive*—e.g., "—is a man and . . . is a doctor." Similarly,

[3] A pair of a predicate "P" is a pair x,y such that Px,y.

a predicate is *join-reflexive* if γ is the sum of α and β, as in the case of "—is a lawyer, and . . . is a no less able lawyer."

None of the last four kinds includes any of the others; and all join-reflexive predicates, but few predicates of the preceding three kinds, are reflexive in the ordinary sense. However, predicates of all seven kinds already described are conveniently grouped together as reflexively *regular*. All other two-place predicates are irregular.

Proofs of the following theorems are available, but cannot be included here. I use "*c*" hereafter as a further abbreviation of "v\{1-pl.\}".

T6. v\{2-pl. redundant\} = v\{1-pl.\} = c.
T7. v\{2-pl\} = v\{1-pl.; 2-pl. irref.\}.
T8. v\{2-pl. regular\} = v\{2-pl. irref.\}.
T9. v\{2-pl. irregular\} = v\{1-pl.; 2-pl. irref.\}.

These, along with similar theorems, tell us that each of the kinds of two-place predicate described above has the same value as a specifiable kind of basis consisting of irreflexive predicates alone.

An n-place predicate is redundant if all its sequences are identity sequences, and totally reflexive if all identity n-ads are sequences of the predicate. But an n-place predicate is unqualifiedly irreflexive only if there is no repetition of a component within any one of its sequences. If we call a sequence with k different components *k-variegated,* the sequences of an irreflexive n-place predicate are all n-variegated, i.e., fully variegated.

However, when the reflexivity classification as a whole is extended to n-place predicates, the number of variant kinds multiplies prodigiously as the number of places increases. Rather than a full list of kinds, we want a schematic description; but here I can give only the briefest sketch.

An n-place predicate may have sequences of many different patterns; e.g., a four-place predicate may have sequences of the patterns "*x,x,z,y,*" "*x,x,x,y,*" "*x,x,x,x,*" "*x,y,z,x,*" etc. (where different letters stand for different elements). But there are certain kinds to which an n-place predicate belongs only if it has no sequences of a given n-place pattern, or only if it has all possible sequences of this pattern, or only if its class of sequences of this pattern bears to its classes of sequences of other patterns a relation comparable to that between the identity pairs and the non-identity pairs of a regular two-place predicate of one kind or another. All the patterns of a predicate for which none of these circumstances obtains may be called its *primary* patterns. Theorems may then be established stating, in sum, that each kind K of n-place

predicate has the same value as the kind L of basis that consists of one k-place irreflexive predicate for each k-variegated primary pattern that a predicate of kind K may have. Thus, for instance, $v\{3\text{-pl.}\} = v\{1\text{-pl.}; 3\text{-pl. irref.}; \text{three 2-pl. irref.}\}$, while the value of the kind of three-place predicate that has no identity sequences is $v\{3\text{-pl. irref.}; \text{three 2-pl. irref.}\}$.

All that has been said so far concerns what might be called first-level reflexivity. But consider a four-place predicate with some of its sequences fully variegated, others not; and suppose that its less-than-fully variegated sequences are just those such that the first two elements and the last two are respectively the first two and the last two elements of different fully variegated sequences of the predicate. Although predicates of this kind have several primary patterns, the value of the kind is $v\{4\text{-pl. irref.}\}$. Such higher level reflexivity properties plainly require treatment analogous to that described for the first-level properties.

This will perhaps be enough to suggest how a complete treatment of reflexivity would lead to theorems equating the value of each kind of basis with the value of a specified kind of basis consisting solely of irreflexive predicates; and it is to the appraisal of irreflexive predicates that I now turn.

4. Transitivity and Self-Completeness

The form of transitivity most relevant to complexity measurement is stronger than that ordinarily defined and may be called *self-completeness*. A two-place predicate "P" is transitive in the usual sense, of course, if Px,y wherever Px,z and Pz,y; but "P" is self-complete only if Px,y wherever Px,z and Pw,y (and x and y are different). In other words, the non-identity pairs of a self-complete predicate are just those that belong to the Cartesian product of the domain and counterdomain of its extension.

Every two-place self-complete irreflexive predicate is always replaceable by two one-place predicates. Every two one-place predicates are always replaceable by a two-place self-complete regular predicate. From this together with T8 we can derive:

T10. $v\{2\text{-pl. irref., self-com.}\} = v\{\text{two } 1\text{-pl.}\} = 2c$.

Self-completeness for predicates of n places is readily defined: an n-place predicate is self-complete if it has among its sequences every n-variegated sequence of elements taken in order from other sequences of the predicate. By reasoning like that for two-place predicates we derive:

T11. $v\{n\text{-place irref., self-com.}\} = v\{n \text{ } 1\text{-pl.}\} = nc$.

Higher-level self-completeness is also easy to handle. A predicate that is not self-complete in the sense just explained may still be self-complete with respect to a set of separate and jointly exhaustive subsequences of its places; for instance, the three-place predicate *"Q"* is self-complete with respect to the place-subsequences (p_1p_3) and p_2 if *Qx,y,z*, wherever *x*, *y*, and *z* are different and *Qx,v,z* and *Qs,y,t*. Such a predicate as *"Q"* is conveniently described as (1,3)(2) self-complete. And any place-subsequence that belongs to a set (of one or more) with respect to which a predicate is self-complete may be called a *partition* of the predicate. Thus the sequence of all the places of a predicate is a partition of it; and any sequence of places that is exhaustively divisible into separate partitions of a predicate is also a partition of it. A *minimal* partition of a predicate is any one of its partitions that contains none of the others.

First-level self-completeness implies self-completeness at all higher levels; e.g., if *"P"* is (1)(2)(3)(4) self-complete it is (1,2)(3,4) self-complete and (1,2,3)(4) self-complete and (1,2,4)(3) self-complete and so on; but the converse does not hold.

Theorem 11 now becomes a special case of the more general principle that the class of *n*-place irreflexive predicates with given minimal partitions has the same value as the kind of basis that consists of one *k*-place irreflexive predicate for each *k*-place minimal partition.

5. Symmetry

A two-place predicate is *symmetrical* if the reverse of each of its pairs is also among its pairs; and we have the theorem:

T12. $v\{\text{2-pl. irref., self-com., sym.}\} = c$.

Moreover, an *n*-place predicate *"P"* is symmetrical if every permutation of every sequence of *"P"* is also a sequence of *"P"*; and the complexity of irreflexive self-complete predicates that are symmetrical does not increase with the number of places, *viz.:*

T13. $v\{n\text{-pl. irref., self-com., sym.}\} = c$.

Although full proof takes several steps, the fact that the value cannot be greater than *c* is obvious from the fact that every predicate of the kind in question can always be replaced by a one-place predicate.

A predicate not symmetrical in the sense defined may yet be symmetrical with respect to a set of separate, equally long, and jointly exhaustive subsequences of places. A four-place predicate

"*P*" is (1,3)(2,4) symmetrical if *Py,z,w,x* wherever *Pw,x,y,z*. Such higher-level symmetry is implied by, but does not imply, first-level symmetry. The following theorem is clearly a generalization upon T13:

T14. $v\{n$-pl. irref., self-com. with respect to a set of k-pl. partitions, and sym. with respect to these$\} = v\{k$-pl., irref.$\}$.

A predicate that is not itself symmetrical at any level may have one or more partitions that are symmetrical at one level or another. For example, suppose "*P*" is (1)(2)(3,4) self-complete, and the three indicated partitions are minimal. "*P*" is then symmetrical in the (non-minimal) partition consisting of its first two places—or, for short, is (1)(2) symmetrical—if *Py,x,z,w* wherever *Px,y,z,w*. "*P*" is also (3)(4) symmetrical of *Px,y,w,z* wherever *Px,y,z,w*. Thus a predicate may be symmetrical in partitions that together exhaust all its places without being (fully) symmetrical, i.e., without being symmetrical in the partition consisting of all its places. But symmetry is always symmetry of a partition.

A predicate that is (1)(2) and (2)(3) symmetrical is also (1)(2)(3) symmetrical. If a predicate is (1,2)(3,4) symmetrical and (1)(2) symmetrical, then it is also (3)(4) symmetrical. If a predicate is (1,2)(3,4) symmetrical and the partition (1,2) divides into two partitions, then so also does the partition (3,4). Obviously these and like propositions must be taken fully into account in computing complexity values.

A rich crop of theorems might now be reaped but they are subsumed under more general theorems soon to be given, and a single illustration must suffice here. The value of the class of nine-place predicates that are (1,2)(3,9)(4,5,7)(6,8) self-complete but only (1,2)(6,8) symmetrical and (4)(5)(7) symmetrical is $v\{$two 2-pl. irref.; 3-pl. irref. sym.$\}$.

6. Two Measures

So far we have developed means for appraising all predicates in terms of bases consisting of irreflexive predicates, and for appraising all self-complete predicates—however symmetrical or non-symmetrical—in terms of bases consisting of predicates of fewer places. But we still have far from a complete ordering of all relevant kinds. In particular, we need ways of dealing with irreflexive predicates that are not self-complete. Our first step toward this goal is to define the *self-completeness measure* and the *symmetry measure* of a predicate. These, as we shall see later, are measures of the effect of self-completeness and symmetry upon complexity-value.

The self-completeness measure of a predicate "P" ('sc$P$') is simply what might also be called the degree of self-completeness of a predicate; that is, the number of rifts between its minimal partitions. In other words, if k is the number of minimal partitions of "P," then sc$P = k - 1$. A predicate that has itself as its minimal partition thus has the self-completeness measure 0; and the maximum self-completeness measure that any n-place predicate may have is $n - 1$.

The symmetry measure of a predicate is not quite so easily defined; for we must take into account the symmetries both of the whole predicate and of shorter partitions, and also the complexity values of the place-subsequences [4] with respect to which all these partitions are symmetrical. Thus the symmetry measure—the effect of simplicity upon complexity—does not directly correspond to what would be called degree of symmetry.

As a preliminary, we may define a *first-level* (symmetry) *stretch* of a predicate "P" as any partition that is symmetrical with respect to all its places and is contained in no other such partition. It can be shown that such stretches are disjoint from each other and are either minimal partitions or divisible into one-place partitions. In defining stretches in general, however, we need to incorporate a clause designed to rule out mere duplications of lower-level symmetries by higher-level ones. An *m-level stretch* is any partition (i) that is symmetrical with respect to m-length place-subsequences of which no two intersect any one lower-level stretch, and (ii) that is contained in no other such partition.

Now if an m-level stretch is symmetrical with respect to h m-length sequences, each having the complexity value k, then $(h-1)k$ is the *symmetry measure of the stretch*. And the *symmetry measure of a predicate* ("sy$P$") is the sum of the symmetry measures of all its stretches.

A few illustrations may be in order. Suppose "P" is an irreflexive four-place predicate and is:

(A). (1)(2)(3)(4) symmetrical; then sy$P = 3c$.

(B). its own minimal partition and only (1,2)(3,4) symmetrical; then sy$P = v${2-pl. irref., sym.}.

[4] This compressed locution may call for explanation. Let $p,p',\ldots$ be k not necessarily consecutive places taken in order from a given n-place predicate "P." Now from each n-ad of "P" abstract a k-ad by taking in order just the components that occur in places $p,p',\ldots$ By the complexity value of the place subsequence $p,p',\ldots$, I mean the value of a k-place predicate having as its sequences just the k-ads so abstracted. A sequence or subsequence of *places* of a predicate must of course be carefully distinguished throughout from a sequence of *elements*, which belongs to the extension of a predicate.

(C). first-level self-complete and only (1)(2)(3) symmetrical; then $\mathbf{sy}P = 2c$.

(D). only (1,2)(3,4) self-complete, (1)(2) symmetrical, (3)(4) symmetrical, and (1,2)(3,4) symmetrical; then $\mathbf{sy}P = 2c + v\{\text{2-pl. irref., sym.}\}$.

In terms of the symmetry and self-completeness measures defined we can state a sweeping and important theorem based upon results explained earlier. The term "numerically determined" as used here means "determined as representable by a specific purely numerical expression, free of signs for unknown quantities."

T15. If K and L are relevant kinds of n-place irreflexive predicate, and $\mathbf{sc}K = \mathbf{sc}L$ and $\mathbf{sy}K \leq \mathbf{sy}L$, and $(vK - vL)/c$ is numerically determined by P1 and P2, then $vK - vL = \mathbf{sy}L - \mathbf{sy}K$.

At the moment I have no formal proof of this theorem but rely upon substantiation by a variety of instances. The most elementary, of course, is that where K is {2-pl. irref., self-com.} and L is {2-pl. irref., self-com., sym.}. Here $(vK - vL)/c = (2c - c)/c = 1$, and $\mathbf{sy}L - \mathbf{sy}K = 1 - 0 = 1$. The reader can construct for himself any number of other examples, where predicates of more places are involved and $\mathbf{sy}L - \mathbf{sy}K$ is greater than 1.

7. The Projecting Postulates

We have come about as far as we can by means of the postulates so far given. What we do now is to adopt a postulate that, so to speak, projects the image of T15 onto another sphere. The formula of that theorem holds for all cases where a certain quantity is numerically determined by P1 and P2. Our new postulate states that the same formula holds where that quantity is not numerically determined by P1 and P2. In other words, the effect of a symmetry measure upon complexity value is postulated to be the same where it can as where it cannot be directly measured by means already at hand.[5]

P3. *If two relevant kinds K and L are like those specified in T15 except that $(vK - vL)/c$ is not numerically determined by P1 and P2, then $vK - vL = \mathbf{sy}L - \mathbf{sy}K$.*

[5] The projecting postulates of the present version of the theory play the role of the device of joints and segments of earlier versions: they generalize, for use in evaluating all bases, formulas established by the replaceability principle within its immediate sphere of application.

This enables us to compare on the basis of symmetry measures the complexity of any two kinds of n-place predicate that have the same—whether zero or greater—self-completeness measure. For example, let K be {2-pl. irref.} and L be {2-pl. irref., sym.}. Here the ratio of $vK - vL$ to c is not numerically determined by P1 and P2; but we know that $\mathbf{sy}K = 0$ and $\mathbf{sy}L = c$. By P3, therefore, $vK - vL = c - 0 = c$. Hence if v\{2-pl. irref.\} is x, then v\{2-pl. irref., sym.\} is $x - c$. The reader will find many other examples.

We can now set forth a very general theorem, similar to but more complicated than T15, concerning the effect of self-completeness on complexity-value:

T16. If K, L, M, N are relevant kinds of n-place irreflexive predicate, and $\mathbf{sy}K = \mathbf{sy}L$, and $\mathbf{sy}M = \mathbf{sy}N$, and $\mathbf{sc}K \leq \mathbf{sc}L$, and $\mathbf{sc}M \leq \mathbf{sc}N$, and $(vK - vL)/(vM - vN)$ is numerically determined by P1, P2, and P3, then $(vK - vL)/(vM - vN) = (\mathbf{sc}L - \mathbf{sc}K)/\mathbf{sc}N - \mathbf{sc}M)$.

For variety, our example this time deals with kinds of irreflexive four-place predicates. Let K be the kind of predicate that is (1,2)(3,4) self-complete, L the kind of predicate that is (1)(2)(3)(4) self-complete, M the kind of predicate that is (1,2)(3,4) self-complete and (1)(2) symmetrical and (3)(4) symmetrical, and N the kind of predicate that is (1,2)(3)(4) self-complete and (1)(2) symmetrical and (3)(4) symmetrical. Here, if x is taken as v\{2-pl. irref.\}, then $(vK - vL)/(vM - vN) = (2x - 4c)/(2(x - c) - (x - c + c)) = 2(x - 2c)/(x - 2c) = 2$; and also $(\mathbf{sc}L - \mathbf{sc}K)/(\mathbf{sc}N - \mathbf{sc}M) = (3c - c)/(2c - c) = 2$.

The reader who has reached this point will guess the next step: adoption of a postulate that projects T16 as P3 projected T15.

P4. *If relevant kinds K, L, M, N, are like those specified in T16 except that $(vK - vL)/(vM - vN)$ is not numerically determined by P1 through P3, then* $(vK - vL)/(vM - vN) = \mathbf{sc}L - \mathbf{sc}K)/(\mathbf{sc}N - \mathbf{sc}M)$.

As an example of what this postulate accomplishes, let us use certain kinds of three-place predicate. Let K be the class of all three-place predicates, L the kind of three-place predicate that is (1)(2)(3) self-complete, M the kind of predicate that is (1,2)(3) self-complete, and let N be identical with L. If x is taken as v\{2-pl. irref.\} and y as v\{3-pl. irref.\}, then we have here $(vK - vL)/(vM - vN) = (y - 3c)/(x + c - 3c) = (y - 3c)/(x - 2c)$; and we have also $(\mathbf{sc}L - \mathbf{sc}K)/(\mathbf{sc}N - \mathbf{sc}M) = (2 - 0)/(2 - 1) = 2$. By P4, accordingly, $(y - 3c)/(x - 2c) = 2$, and therefore $y =$

$2x - c$. This, then, enables us to do what we could not do earlier: determine $v\{$3-pl. irref.$\}$ if we are given $v\{$2-pl. irref.$\}$ and c.

We saw in preceding sections how to determine the values, relative to c, of all kinds of first-level self-complete predicate. Now we have a way of determining the values, relative to c and $v\{$2-pl. irref.$\}$, of all kinds of predicate not stipulated to be first-level self-complete. This concludes the comparative part of the theory.

8. The Quantitative Postulate

To achieve a fully quantitative theory we need only fix c and $v\{$2-pl. irref.$\}$. Instead of doing this quite arbitrarily, I adopt a postulate that is unnecessarily broad but that suggests the considerations leading to the assignment made.

P5. *Just those kinds that are determined by preceding postulates to have the same value as {1-pl.} have the value 1; and every other kind has the lowest integral value consistent with this requirement and preceding postulates.*

The choice of integral values does not, I think, call for any justification. Rather a choice of non-integral values where integral ones will do would have to be justified.

Our postulates now fix c as 1, and $v\{$2-pl. irref.$\}$ as 3; and thus fix the value of every relevant kind. Some general theorems are:

T17. $v\{n\text{-pl., irref.}\} = 2n - 1$.
T18. $v\{n\text{-pl., irref., self-com.}\} = n$.
T19. $v\{n\text{-pl., irref., sym.}\} = n$.
T20. $v\{n\text{-pl., irref., self-com., sym.}\} = 1$.

And we have the important principle that the value of any kind of n-place irreflexive predicate is $2n - 1$ minus the sum of its symmetry and self-completeness measures:

T21. If K is a relevant kind of irreflexive n-place predicate, then $vK = 2n - 1 - (\mathbf{sy}K + \mathbf{sc}K)$.

If we take the maximum symmetry measure that any relevant kind of irreflexive predicate of four or more places may have and add this to the comparable maximum self-completeness measure, the sum will be greater than $2n - 1$; and this might lead to the hasty conclusion that some of these kinds will have zero or negative values, in contradiction to P2. But the symmetry measure is affected by the self-completeness measure in such a way that the sum of the two for any of these kinds is never greater than $2n - 2$.

In section 3 we saw that every kind not restricted to irreflexive predicates has the same value as a specific kind of basis consisting solely of irreflexive predicates; for example, that $v\{3\text{-pl.}\} = v\{1\text{-pl.}; 3\text{-pl. irref.}; \text{three 2-pl. irref.}\}$. Thus in the light of the present section $v\{3\text{-pl.}\} = 1 + (2 \cdot 3) - 1 + 3((2 \cdot 2) - 1) = 15$. As the number of patterns increases rapidly with n, so does the complexity value. $v\{5\text{-pl.}\}$, for instance, is 250; and the general formula,[6] for which I am indebted to N. J. Fine, is:

T22. $$v\{n\text{-pl.}\} = \sum_{k=1}^{n} (2k - 1) \frac{\Delta^k}{k!} (0^n).$$

9. Evaluation of Primitives

The formulas given are for kinds. A given predicate or basis has the value of the narrowest relevant kind it belongs to. But the actual problem facing us in appraising the complexity of an extralogical basis of a system is to assign a value on the ground of such information as may be provided by the postulates of the system or by the interpretations supplied for the primitives. Often this does not constitute all the information that would be pertinent to the determination of complexity-value. What we do is assign each primitive the maximum value consistent with the available information. This value may be greater than the actual value of the predicate in question; rather it is the value of the predicate relative to that information—or, so to speak, the value of the primitive 'idea.' For example, a two-place predicate "P" may in fact be self-complete and symmetrical, and thus have the value 1; but if we are able to determine only that it has the first of these properties, the value of "P" as a primitive idea of the system is 2.

As among bases having the same complexity-value, and only as among such bases, certain rather obvious supplementary rules of choice apply. These can perhaps best be summarized as follows. Suppose B and B' are of equal complexity-value. Let K be the kind of basis that has, for each n, the same number of n-place predicates as B but is not otherwise restricted; and let L be the kind that bears a similar relation to B'. Now if $vK < vL$, then in a sense B has less unused potential complexity than B', and is preferable on this ground. For instance, if a single three-place symmetrical predicate and a set of three one-place predicates are

[6] The formula given in "New Notes on Simplicity" is correct for predicates of three or fewer places only; for predicates of more places, the values it gives are too low.

alternative bases for a given system, then—even though each has the complexity-value 3—choice of the latter is indicated.

Let me emphasize, in closing, that I do not by any means deny that considerations quite other than those studied in this paper may legitimately enter into the choice of basis for a system.

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TWO MEASURES OF COMPLEXITY[1]

NELSON Goodman has devoted considerable effort to the development of a satisfactory measure of the logical complexity of predicates and of systems of predicates. A set of predicates is more complex than a second set if, roughly speaking, it can be used to express more. The less complex set is referred to, by Goodman, as "simpler." This notion of simplicity must be sharply distinguished from that of the simplicity of laws, which is the commoner usage of the word 'simple.'[2] Goodman's concept concerns the richness of a conceptual scheme, while the simplicity of a law depends not only on the predicates used but also on the form and content of the law. It has been agreed that the present symposium should concern itself only with the former concept.

The importance of Goodman's pioneer work is generally acknowledged. But it is not to be expected that any one man can accomplish the task of giving a completely satisfactory explication of so difficult a concept. The purpose of this paper is to build on the foundation laid by Goodman's earlier work. Two new explicata will be offered. The first one is a direct outgrowth of Goodman's explicatum while the second one is constructed on a new idea.

Section 1 gives the first explicatum, which is based on a modification of Goodman's original approach. In section 2 the problem of dependences between predicates is considered, in its most general form. Section 3 will sketch an extension of the definition to higher languages. Finally, in section 4 an entirely new explicatum will be discussed.

[1] To be presented in a symposium on "The Concept of Logical Simplicity" at the annual meeting of the American Philosophical Association, Eastern Division, December 28, 1955.

The author is indebted to Paul Oppenheim for valuable suggestions at the early stages of research, and to R. Carnap for his suggestions for improving an earlier draft.

[2] The author has in the past restricted the use of 'simplicity' to scientific theories. Cf. "The Use of Simplicity in Induction," *The Philosophical Review*, Vol. LXII (July, 1953), pp. 391–408.

1. The First Explicatum

The intuitive idea behind Goodman's explicatum is best expressed in his fundamental principle: "The assignment of complexity-values to predicates must be such that if each basis of kind A is always replaceable by some basis of kind B, while it is not the case that each basis of kind B is always replaceable by some basis of kind A, then any basis of kind B must, in the absence of other indications, have a higher complexity-value than any basis of kind A."

This principle can be well illustrated by choosing bases having only a single predicate. Consider a one-place predicate, a symmetric two-place predicate, and an ordinary two-place predicate. It is easy to show that they must receive increasingly higher complexity-values, since a two-place predicate can replace a one-place predicate, and since an ordinary predicate can replace a symmetric one, but not conversely. Goodman assigns to them the values 1, 2, and 3.

Indeed, the complexity-values in Goodman's basic definition are just the smallest integer values compatible with the quoted principle. Goodman then proceeds to find a rational reconstruction of why he arrives at these minimal values, but his method of "joints" is not very convincing. The first definition of the present paper will start out with Goodman's principle, but it will choose the exact complexity-values in what appears to be a more intuitive manner.

Predicates are used in a formal language to express properties and relations. (We can refer to a property as a "one-argument relation," and hence speak of relations only.) The one-place predicate P is used to express the singulary relation $\lambda x.Px$. A two-place predicate R (e.g., "likes") is normally used to express the binary relation $\lambda xy.Rxy$ ("x likes y"), but it can also be used to express the relation $\lambda xy.Ryx$ ("x is liked by y"), or the singulary relation $\lambda x.Rxx$ ("x likes himself"). If R is symmetric, then the first two relations are the same. E.g., the symmetric relation "is a sibling of" is equivalent to its converse "has as a sibling." We find one basic relation for P, two for a symmetric R, and three for a regular R. These are exactly the complexity-values assigned by Goodman. *The new proposal is to take the number of basic relations expressible by a predicate as its complexity-measure.*

Let us apply this definition to an ordinary three-place predicate S. Its primary use is to express the ternary relation $\lambda xyz.Sxyz$. But it can express five more ternary relations, gotten by permutations of the arguments. It can also express $\lambda xy.Sxxy$

and five other binary relations. Finally, it can express the singulary relation $\lambda x.Sxxx$. This would suggest the complexity-value 13 for S, as opposed to 5 given by Goodman's definition. It will be shown below that this higher value allows finer distinctions between the complexity of various types of predicates.[3]

It is not too difficult to construct a formula for the complexity of an ordinary n-place predicate. It can be used to express k-ary relations for $k = 1, 2, \ldots, n$. Let c_{kn} be the number of k-ary relations that can be expressed by an ordinary n-place predicate. Then its complexity is given by:

$$c_n = \sum_{k=1}^{n} c_{kn}. \tag{1}$$

How do we count the number of k-ary relations? Such a relation is expressed by writing 'λ' followed by k variables in a fixed order, then the predicate letter, and finally n spots filled in by means of the k variables, using each one at least once. Thus c_{kn} is given by the well-known combinatorial formula for the number of ways in which n blanks can be filled with k types of objects, using each type at least once:

$$c_{kn} = \sum_{i=1}^{k} (-1)^{i+k} \binom{k}{i} i^n. \tag{2}$$

Some sample values will be found in the table given below.

2. Dependences

The above approach is easily extended to the case of a set of independent, ordinary predicates: Their complexity is just the sum of the individual complexities. But the predicates could be dependent, and the individual predicates need not be "ordinary."

The key to these two problems is that there is only one problem. A symmetric predicate, or any other non-ordinary predicate, is but an example of a set with a single element which is dependent.[4] Such dependences arise out of conventional meaning relations

[3] Since this paper was written, Nelson Goodman has pointed out to the author that, in more recent versions of his definition, the value 15 is assigned to a three-place predicate. This is much closer to the value given by the present definition.

[4] The fact that a single predicate can be dependent was pointed out by the author in a review, *The Journal of Symbolic Logic*, vol. 16, pp. 205–207, September, 1951; and shortly afterwards, independently, by Bar-Hillel, *Philosophical Studies*, vol. 2, pp. 72–75, October, 1951.

between extra-logical predicates. It must be supposed that these relations are explicitly stated in the form of axioms in our formalized language, by so-called *meaning-postulates.*[5] E.g., if S is to express the relation between three people that the first is the father of the other two, then the predicate is symmetric in its last two places, and this fact must follow from the meaning-postulates. And if M expresses the property of being a male, then it must be demonstrable that whenever three people stand in the S-relation, the first one of them has the property M.

The effect of meaning-postulates is to establish certain analytic connections between predicates which are not determined by the purely formal structure of the language, but are due rather to the usage of the words. This approach to dependences is quite different from Goodman's. He considers that such questions as to whether a predicate is symmetric are questions of the available information, and hence an apparently syntactic concept has a pragmatic element in it. This is undesirable, and it also appears to be in error.

A predicate may be symmetric analytically, or it may be symmetric as a matter of physical fact. The three-place predicate discussed above is symmetric in its last two places due to its meaning. The two-place predicate "likes" is not analytically symmetric. But it could be the case that as a matter of fact whenever a likes b, b also likes a. Since we are discussing measures of the logical complexity of predicates, the latter—synthetic—symmetry is entirely irrelevant. Analytic symmetry is highly relevant, but that is *not* a question of information. Knowing whether a predicate is analytically symmetric is involved in understanding the language. And we certainly want to require a full understanding of our language.

What is the effect of meaning relations? When we write down our list of basic relations, we find that they are no longer all different, or at least that certain connections exist between them. So, if we count their number, we get a result that is too high. We must find a generalized method for counting which gives simply the number of basic relations in the case of independence, but which gives an intuitively smaller number when dependences exist.

It is very easy to give some rules-of-thumb to start with: (1) If two relations are equivalent, count only one. (2) If two relations are contradictory, count only one. (3) If a relation is (analytically) universal or empty, don't count it. Even these simple rules allow us to prove some interesting results.

[5] Cf. "A new approach to Semantics—Part I," *The Journal of Symbolic Logic*, September, 1955.

Consider an $(n+1)$-place predicate that is symmetric or asymmetric in two arguments. We may, without loss of generality, assume that this holds between the last two arguments. In counting basic relations we must distinguish the case where the last two arguments are the same from the case where they are different. It is immediately seen that there are c_{kn} k-ary relations of the former kind, and hence there are $(c_{k(n+1)} - c_{kn})$ of the latter. In this latter case, where the two arguments are different, we can pair a relation off with the one having the last two arguments reversed. In the symmetric case the pairs are equivalent, in the asymmetric case they are contradictory. In either case only one of each pair must be counted. Summing over k we get

$$(3) \qquad \tfrac{1}{2}\,(c_{n+1} - c_n).$$

We must still consider the relations having the same argument in the last two places. For the symmetric predicate these must all be counted; summing them we get c_n, which added to (3) gives:

$$(4) \qquad \tfrac{1}{2}\,(c_{n+1} + c_n).$$

But for the asymmetric predicate these are all empty (self-contradictory), and hence (3) is the complete answer. So we see the symmetric predicate has a complexity half the sum of an ordinary predicate of that many places and an ordinary predicate of one less place, while the complexity of the asymmetric predicate is half the difference of the two ordinary complexities.

Let us consider one more example, with a much stronger dependence. Take an n-place predicate in which the order of the arguments makes no difference. Let us call this a thoroughly symmetric predicate. It can be shown that its complexity is 2^{n-1}. Some typical values are given in the following table:

TABLE 1

No. of places:	1	2	3	4	5
Ordinary predicate	1	3	13	75	541
Symmetric in 2 arguments		2	8	44	308
Asymmetric in 2 arguments		1	5	31	233
Thoroughly symmetric predicate	1	2	4	8	16

This table also shows why it is an advantage to have somewhat higher complexity-values than given by Goodman's definition. We have three special types of three-place predicates. The present method allows us to have all of them between the ordinary two-place and the ordinary three-place predicate in complexity-value. The lower complexity values make such fine distinctions impossible.

We are now ready to consider the general method for treating dependences. It is easier to state this method if in place of the basic relations we put atomic sentences. E.g., the relation $\lambda xy.Sxyy$ would be represented by *Sabb*. Our problem then is the following: We have a list of atomic sentences. We want a measure function that will give us the number of atomic sentences if they are independent, and some intuitively chosen smaller number if they are not. This is similar to a problem solved by the author in another connection.[6] Consider all non-self-contradictory conjunctions that we can form by taking for each atom either it or its negation. If we have a independent atoms, then we get 2^a conjunctions. But the effect of dependences is to make some of these conjunctions self-contradictory. It has been shown elsewhere (*loc. cit.*) that the number of these conjunctions is a good measure of the degree of dependence. This suggests that we *count the number of non-contradictory conjunctions and take $\log_2$ of this number as our measure of complexity.* That this procedure is reasonable is shown by the fact that the three rules-of-thumb stated above all follow from this definition.

We will examine an example of this method, which could not be handled by the rules of thumb. $P_1,\ldots,P_f$ is called a *family* of predicates if one and only one of these properties applies to every individual, i.e., if they are mutually exclusive and exhaustive. The characteristic atoms are $P_1a,\ldots,P_fa$. But we find no equivalent or contradictory pairs, since all pairs are contraries but not contradictories. We get 2^f conjunctions of the form $\pm P_1a,\ldots,\pm P_fa$, but most of these are self-contradictory. We get a non-self-contradictory conjunction only by affirming one atom and denying all others. Since there are f such conjunctions, the complexity-value of the family is $\log_2 f$.

This result has a highly intuitive interpretation when $\log_2 f$ is an integer: It can be shown that such a family can be replaced by exactly $\log_2 f$ ordinary properties. Hence the complexity is independent of the form chosen. E.g., let the family consist of "tall," "fairly tall," "fairly short," and "short"; where we suppose that all human beings can be so classified in a unique way. The family could be replaced by the two ordinary predicates "above average" and "far from average," where the former expresses that a person is tall or fairly tall, while the latter expresses that he is tall or short. The two ordinary predicates have complexity $1+1=2$. The family has complexity $\log_2 4 = 2$.

[6] "A logical measure function," *The Journal of Symbolic Logic*, Vol. 18 (December, 1953), pp. 289–308.

We now have a method which works for any set of predicates from the first order functional calculus, and where we can treat dependences of any kind.

3. Higher Languages

There appears to be no essential difficulty in extending this method to more advanced logical systems. Due to limitations of space we must limit this discussion to the barest sketch of how the method could be extended to a higher order functional calculus.

The method given above had two distinct parts: A representation must be found for the various ways in which a predicate is used, and a method of counting is needed that takes dependences into account. The former is solved by forming basic relations, or alternatively basic atoms; the latter is then achieved by counting the number of non-self-contradictory conjunctions constructible from these atoms, and taking $\log_2$. There is no difficulty in the second step for any language. The problem is one of finding a satisfactory list of basic atoms representative of various uses of the predicate.

In a higher order functional calculus we are confronted by various new difficulties: Predicates can be of various types, their arguments may be of various types, and the arguments themselves take on predicates of many places and types. The discussion is further complicated by the fact that no really simple notation has been devised for predicates in a higher functional calculus.

For every predicate we still have an atom representing its commonest use, and various permutations of its arguments may be permissible. But in addition there are "degenerate" uses. Three ways of getting degenerate uses appear: (1) By identifying two of its arguments. This was the method used above—the other two methods are available only for higher languages. (2) By replacing one of its $(i+j)$-place arguments by an i-place and a j-place argument. (3) By replacing one of its arguments by one of lower type.

These can be illustrated in a fairly simple example. (Greek letters will stand for predicates of higher types.) The example will consist of a ternary relation between two individuals x, y and a binary relation of properties ρ: "For every property of x there is a property of y standing in the relation ρ to it." Let us apply the three types of degenerations. (1) 'y' is replaced by 'x'. "For every property of x it has a property (possibly the same) which bears the relation ρ to the first one." E.g., if ρ is the identity relation, then all x bear this degenerate relation to it. (2) Replace

ρ by the conjunction of a property ϕ applied to its first argument, and ϕ' to its second argument. "For every property of x there is a property of y such that the former is a ϕ, the latter is a ϕ'." Actually, this is equivalent to "Every property of x is a ϕ, and at least one property of y is a ϕ'." (3) Lower the type of the argument of ϕ', say by taking as its argument only unit-sets of individuals. Then ϕ' is in effect a property of individuals. "At least one property of y is a ϕ'" then asserts that y has this property of individuals.

Even this very simple example runs into great conceptual difficulties. We must conclude that while there is no difficulty *in principle* in extending this method to higher languages, in practice we would run into difficulties due to the lack of a suitable technique for handling such languages.

4. The Second Explicatum

Let us take a more careful look at the logical status of our problem. We are given a set of predicates, and we want to measure its complexity, i.e., the richness of description allowed by the set. But such predicates cannot be considered in themselves. They must have a framework, a logical system to which they belong. It is also clear that we are interested only in extra-logical predicates. We are interested in predicates like "tall," "short," "green," "father of," etc., which are used to describe the world we live in. In general, the more such terms we have available, the more detailed is the account that we can give of our experiences.

This structure can be made precise if we make use of the new approach to Semantics described by the author in a recent article.[7] While the technical details of that paper are highly complex, we will only need a few basic ideas, which can be easily summarized. The fundamental concept used for formalized Semantics is that of a "model" or "interpretation" of a logical system. A connection is established in the paper between these models and Leibnitz's "possible worlds." There is one model that represents the "actual world," and all the other models represent worlds that are possible but not actual. As is shown in the paper, "possible" is not to be taken in any metaphysical sense, but rather in a linguistic one:

[7] *Loc. cit.* fn. 5. In that paper the concept of an interpretation agreed with that of a model only in a logically complete language; otherwise it is a narrower concept. To avoid technicalities, the two terms are here used as if they were synonymous. To be absolutely correct, the second explicatum should be based on the concept of an interpretation, rather than that of a model.

These are the worlds that we can distinguish, given our formal language.

It is clear from the previous discussion that the number of possible worlds we can distinguish, i.e., the number of models, is a good measure of the richness of the extra-logical vocabulary. We will count the number of models for the given language and let the complexity-value be some function of this number.

Presupposed in this approach is that the number of models is finite.[8] This number depends partly on the extra-logical predicates and partly on the cardinality of the individual domain of the logical system. We must, therefore, assume that the logical system has a finite domain of individuals. This is reasonable for a scientific language. We will have as individuals such collections as the human beings in the U. S., or the plants of the universe, or even all physical objects in the universe between 10 billion B.C. and 100 billion A.D. All these collections are, presumably, finite. With the usual kinds of extra-logical predicates, the number of models will be finite. E.g., in a theory of types, if the domain of individuals is finite and if we have only a finite number of extra-logical predicates, all of finite type, then the number of models is finite.

We must now find what function of the number of models to take as the complexity-value. We are guided by the following four facts: (1) If the number of models for one set of predicates is m_1 and for a second set is m_2, and if the two sets are independent of each other, then the number of models for the union of the two sets is $m_1 m_2$. (2) If there are no extra-logical predicates in the language, there is exactly one model. (3) If there is just one extra-logical predicate, which is a one-place predicate, and if there are N individuals in the language's individual domain, then there are 2^N models. (4) If the language is as in the previous case, only the one predicate is a two-place predicate, then the number of models is 2^{N^2}.

We want to choose a function f, so that if the number of models is m, the complexity value is $f(m)$. From the first fact we see that $f(m_1 m_2)$ should equal $f(m_1)+f(m_2)$. From the second fact we infer that $f(1)$ should be 0. Hence we know that f must be a logarithm to some base. Say, $f(m) = \log_b m$. From facts 3 and 4 we see that the complexity-value of a one- or two-place predicate will be $N \cdot log_b 2$ and $N^2 \cdot log_b 2$. It is inevitable that the complexity-values will turn out functions of N. But at least we can simplify

[8] In particular, we note that the measure is restricted to scientific languages that classify. As soon as measurement enters, i.e., if we have a single numerical function, the complexity is infinite.

them by letting $\log_b 2 = 1$. Hence we choose $b = 2$ as our base: $f(m) = \log_2 m$.

The complexity of a set of extra-logical predicates, added to a basic logical system, is determined by *counting the number of models and taking $\log_2$ of this number.*

This method has the very great advantage that it is applicable to a tremendous wealth of languages. The concept of a model has been defined for every language that can be formalized along the customary lines. All we need in addition is that with our set of extra-logical predicates the language have but a finite number of models. This gives us a very great degree of freedom.

The disadvantage of the method is that the complexity-values are very large, and that they depend on N. The complexity of a one-place predicate is N. We could make this 1 by dividing our measure by N; but the complexity of a two-place predicate would be reduced from N^2 only to N, and that of a three-place predicate would still be N^2. There are deep reasons why the values are so large, and why they are tied to N.

Consider the question of using a single two-place predicate in place of a set of one-place predicates, say R in place of $P_1, P_2, \ldots$. The discussion will be simplified if we assume that every individual has a name in the language. To use R in place of P_1 we will have to choose some particular individual i_1, and let Ri_1x stand for P_1x. Similarly, we select i_2 and let Ri_2x stand for P_2x, etc. Thus we have N *P's* represented by R. On the other hand, we can show that you cannot represent more *P*'s: By means of p *P*'s we can express pN atomic sentences. By R we can express N^2 atomic sentences. Hence R cannot represent more than N *P*'s. Thus we arrive at the conclusion that R should have a complexity N times as great as that of P—which is what our measure gives.

While there are good reasons for this dependence of the measure on N, it is inconvenient when in practice we don't know the exact size of N. The author has presented a method [9] which is applicable to such measure-function for an N whose exact size is unknown but which is known to be very large. The complexity-value must, according to this method, be thought of not as a number but as a function of N. Two such functions are then compared by their asymptotic behavior: If, for all sufficiently large N, $f_1(N) > f_2(N)$, then we say that $f_1 > f_2$. According to this approach a two-place predicate would have higher complexity than any finite number of one-place predicates, and a three-place predicate would have higher complexity than any finite number of two-

[9] *Loc. cit.* fn. 6.

place predicates. Since a predicate of more places can take the place of any "reasonable" number of predicates of less places, there is some intuitive justification for these results. It is entirely optional whether we accept the large numerical values, or whether we prefer this asymptotic comparison method.

A second great advantage of this definition is that dependences are handled perfectly automatically. The effect of having a meaning-postulate is that the number of models is decreased. This follows from the fact that all axioms of the language must be true in every model. A meaning-postulate is an axiom of the system. If we know what the models are without this postulate, then we find the models of the entire system by dropping all those in which the postulate is false. As long as we have the concept of a model defined for the language, and as long as all dependences are explicitly formulated in terms of meaning-postulates, the definition gives intuitive complexity-values automatically.

The table below will give the values for the second explicatum corresponding to Table 1. This will serve as a basis for comparison. Some of the previous pattern remains. A symmetric predicate has complexity half the sum of two ordinary predicates, while an asymmetric predicate has half the difference. Again, if N is very large, then the order of the complexities in each column is the same as in Table 1. But the real difference is that here every i-place predicate has a complexity of the order of magnitude of N^i, which is greater than that of all predicates with fewer places.

TABLE 2

No. of places:	1	2	3	4	5
Ordinary predicate	N	N^2	N^3	N^4	N^5
Symmetric in two arguments		$N(N+1)/2$	$N^3(N+1)/2$	$N^3(N+1)/2$	$N^4(N+1)/2$
Asymmetric in two arguments		$N(N-1)/2$	$N^2(N-1)/2$	$N^3(N-1)/2$	$N^4(N-1)/2$
Thoroughly symmetric predicate	N	$N(N+1)/2$	$N(N+1)(N+2)/6$	$N^4/24+\cdots$	$N^5/120+\cdots$

5. Conclusion

Two new definitions of the complexity of a set of extra-logical predicates have been proposed. The first is a direct outgrowth of Goodman's work, while the second rests on an entirely new idea.

The former has the advantage of having easily manageable numbers as values, but it runs into practical difficulties when we try to extend it to higher languages. The second definition is easily applied to a wide variety of languages. It is also more directly intuitive. But we have to pay the price of having either very large complexity-values depending on a possibly unknown parameter, or of having functions as values.

These relative advantages and disadvantages are such that no doubt there will be no general agreement as to which definition is preferable. For this reason they were presented side by side so that both the strong and weak points of both definitions should be apparent.

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THE CONCEPT OF INTENTION IN ART CRITICISM[1]

IT is comparatively easy to argue oneself into either of two opposed views about the intention of the artist and interpretations of his work. We notice that people often find very different sorts of things in the same poems, paintings, musical compositions. In some cases, at least, it seems clear that there is a right and a wrong way to read a poem or look at a picture or listen to a symphony. Surely, art criticism is not a game like finding shapes in clouds. There must be, one is inclined to argue, something to which correct or right interpretations conform, and from which incorrect or wrong interpretations deviate. The artist's intention, taken as the plan or design he has in mind when composing his work, appears a likely candidate for the role of standard here. But at once we are faced with arguments from the other side. How do you find out what the artist's intention is? If he has carried out his intention successfully, the work itself should show what he was trying to do. If he has not done what he intended, then he can best make his intention plain by creating another and different work of art. Preliminary plans or sketches or designs, of course, might give us some idea, but in any case we center on works of art, actual or publicly indicated, not on inner workings of the artist's psyche. To follow that trail is to pursue psychological speculations leading to unconscious intentions and motivations which have nothing to do with the artistic

[1] To be presented in a symposium on "Intention and Interpretation in Art" at the annual meeting of the American Philosophical Association, Eastern Division, December 28, 1955.

features of the work. The poems, the paintings, the symphonies are there. Read them, look at them, listen to them, attentively and intelligently. The standard you seek is to be found in the work.

In attempting to unravel some of the puzzles connected with the concept of intention in art criticism, I shall concentrate mainly on literary criticism. This is a large enough area to consider in a brief paper. Each area of the arts has its special aspects of the general problem. It would be foolish to attempt to deal with them all in a single way. The area I propose to concentrate on has an advantage beyond that of supplying needed limitations. The issues in question are important ones in the literary field, and the opposed views I have outlined are exhibited there. The demolishing of straw men is instructive only in so far as live models for the effigies can be found.[2]

What is responsible for the puzzles about the intention of the artist? There are, I believe, two main reasons. Both sides in the controversy have neglected the sort of simple situation, on the outskirts of professional criticism, in which we often sensibly and usefully employ the concept of intention. The Intentionalists have neglected such situations by taking only a quick look at them; their opponents' neglect consists in not looking at all. Also, neither side has noticed that the phrase "the interpretation of a poem" is deceptively ambiguous, applying to two somewhat different accomplishments.

Before I attempt to remedy the first neglect, the following remarks will be in order. It is beyond the scope of this paper to tackle the most important questions connected with the concept of intention. These lead into almost all the most vexing problems of philosophy. However, an understanding of how the concept operates in one limited domain and for limited purposes may throw some light on more basic philosophic issues. It is plain, for example, that what literary critics are concerned with when they deal with the concept of intention, is not some mysterious mental act of the author, containing within it the real or essential poem. One of their main concerns can be put in this way: Should the

[2] I have in mind throughout this paper the following two articles: "Esthetic Ambiguity," *Philosophy and Phenomenological Research*, Vol. VIII, No. 3 (March, 1948), pp. 415–435, by Abraham Kaplan and Ernst Kris, and "The Intentional Fallacy," *The Sewanee Review*, Vol. LIV, no. 3 (July, 1946), pp. 468–488, by W. K. Wimsatt, Jr. and M. C. Beardsley. In the latter article, the author's intention is rejected as a standard of rightness; in the former, it is accepted. Kaplan and Kris add two other standards, but there is much in their work which gives intent a special importance, and a kind of preëstablished harmony between the standards is postulated.

way in which an author does or would read (interpret) his poem be accepted as the right or correct reading? I do not at all wish to equate the concept of the author's intention with the way he interprets his work. But one has in the latter closely related notion a way of dealing with the issues which will not lead too far afield and which will serve pretty well to define the competing positions. I propose, then, to use it later as a non-equivalent substitute.

Let us look now at two slightly different kinds of situations on the outskirts of art criticism. The concept of the intention of the maker or producer is employed in both. Suppose I am asked by a child to look at clay figures he has modeled. The first I take to be a cat, the second a dog, the artist agreeing. Then comes one that puzzles me. Is it a deer or a rabbit? What did you intend? What is it supposed to be? In so far as I do not know "how to look at the figure," as one might say, these are not foolish questions to ask. Rather, to abstain from asking them would be foolish. (I exclude from consideration here any such grounds of abstention as that of hurting the feelings of the artist or turning him into a representationalist.) Consider next a somewhat different case. I overhear a singer doing what I take to be singing a scale and doing it very badly. I later learn that the man was not trying to sing a scale at all—he was just doing vocal warming up exercises. Under these circumstances, I would presumably change my appraisal of the performance. What is involved in both cases is the familiar notion (not at all peculiar to the fine arts) that knowledge of a performer's or maker's intention, aim, goal, is relevant to understanding and appraising the performance or product. The notion, however, remains excessively vague unless the following questions are answered: (1) How do we find out what the intention of the maker or performer is? (2) Does the determination of the maker's or performer's intention automatically settle the question of how we should interpret the product or performance?

There are at least three ways regularly employed (where possible) for finding out the intention of the maker or performer: (a) asking him, (b) examining the context, social and historical, of his making or performance, and (c) inspecting the product or performance. If the man in question is dead or otherwise unavailable, we cannot use (a). If he is available but inarticulate, mentally disturbed, or hypocritical, we cannot rely on (a). Where (a) is usable there are no permanent circumstances which make it always reliable or always unreliable. There are, however, situations in which, while (a) would be usable and reliable, it would

be foolish to employ it, because methods (b) and (c) settle the question sufficiently well. I do not have to ask an opera singer, performing in public, whether or not he is trying to sing the notes true or just warming up his vocal cords. The satisfactoriness of (c) will depend in part on the nature of the product or performance, and in part on the background and training of the onlooker. The person who is puzzled by certain contemporary paintings and asks what the artist was trying to do, is not always well served by being told to keep on looking at the pictures.

As for the second of our questions, the answer is "no." The basis for the simple negative is complicated. It will be convenient to start the explication by returning to the case of the singer warming up his physiological equipment, and my misapprehension of his aim and consequent misappraisal of his skill. This kind of situation—particularly in the performance arts—looked at with too little care, and made the grounds for too much generalization, leads to Intentionalism. What is noticed is that it is foolish, even unreasonable, in the case in question, to regard the performance, as far as aim is concerned, in a way different from the performer's. The following features and their import are not noticed. The case belongs among those situations in which the goal or aim of a performance is pretty well fixed by social habit, convention, even explicit agreement, in which the performer shares. Various sorts of sports performances fall into this category along with performances in the fine arts. Moreover, appraisals of such performances are, again by some sort of social agreement, limited to judgments of skill. It is important to notice that the performer's aim provides the right way of looking at and judging these performances only in so far as it coincides with the socially accepted aim. Hence, the performer's intention is not, strictly speaking, a standard at all. The entrant in the hurdle race who claims, after he has knocked down all hurdles, that he intended to do so, disqualifies himself from the contest. The ballerina fares no better who says she was trying to provide comic relief when she fell down in the middle of a serious ballet. If an onlooker, through some kind of ignorance, mistakes the aim accepted by both performer and audience, his appraisals of skill may be called "misappraisals." It makes sense to say that he is wrong.

The pattern abstracted from our second example does not, however, fit all situations in which we are called upon to interpret a work of art. Our first example, that of the child's clay figures, points to situations where our problems are of the following kind. We are confronted with an art product and do not know, as we say, "how to look at it." It appears as a "jumble," no clear

pattern emerges. Or, we are faced with alternative interpretations of a product, correlated for us with different ways of seeing it. Shall we look at this piece of child sculpture as a representation of a plate of doughnuts or as a precocious study, in the manner of Henry Moore, of the human form? Shall we give both the doughnuts and the Moore-like study a Freudian interpretation? Here there are no publicly accepted goals or aims to guide me. Do I have to fall back on the artist's interpretation as a standard? Before going further, I should like to say that I do not wish to deny all resemblances between the first and second examples. Nor do I wish to tie the differences I shall be concerned with to the differences between performances and products. It has been convenient only to illustrate the differences in these terms.

The kind of situation most relevant to my inquiry is that in which one is confronted with a choice between alternative interpretations of a work, each of which usually carries with it a different way of seeing the object. I propose to concentrate on the field of literature for my illustrations. Some brief elucidations of the terms I shall employ are in order here. Thus far, I have used "different ways of seeing," "different ways of looking at," in a sense made clear enough by the ambiguous pictures in textbooks of psychology, if not by our everyday usage. It is a matter of differences in perceptual experience. An interpretation of a picture, however, is some sort of account of what it is a picture of, or what it resembles, suggests, how its parts are related, and so on. For most of us, different interpretations carry with them different ways of seeing the things in question. We use, and for good reason, the vocabulary of visual perception in connection with literature. The man who, for example, adopts Ernest Jones' interpretation of *Hamlet,* ordinarily "sees" the play differently than does one who rejects the Freudian explanation. The differences in casting, emphasis, and so on, between the movie version of *Hamlet,* and other productions, serve as a good example of what is involved in a director's seeing a play in a certain way. Assuming that certain of these differences, with appropriate changes, would remain for the man not envisaging production but merely reading the play, we have an example of what we mean by "looking at" non-dramatic literature in certain ways. It should be noticed that the possibility of there being a choice between different ways of looking at a literary work, depends partly on the make-up and background of the reader and partly on the character of the work. It might well be useless to advise Ernest Jones to see *Hamlet* in a non-Freudian way, and this play has called forth more differing interpretations and ways of seeing than have

the other dramas of Shakespeare. Some of us, however, in relation to some literary works, are confronted with a choice between different interpretations correlated with different ways of seeing. (A certain amount of work and study may be required to achieve a way of seeing a work of literature.)

How do we make a reasonable choice in the kind of situation in question? Let no one reply here, "We should adopt that interpretation which fits the work the best." I shall later, when discussing ambiguities of "interpretation" which I here ignore, consider the notion of an interpretation fitting a work of literature. For the present, it will suffice to say that no problem of choice exists unless we are confronted with different interpretations, all of which more or less fit the work, though perhaps not equally well in the same parts. Also, I shall exclude from consideration the man whose purpose it is to see a given literary work in as many ways as possible.

The word "purpose" is a clue here. The concept of purpose is allied to, but not exactly coincident with, the concept of intention. Disregarding the differences, we might say that some philosophers have fallen into over-simplified and dogmatic positions about the artist's intention, because they have neglected the intentions of the interpreter or onlooker. They have attributed to him a simple, standard "aesthetic" purpose, in relation to which there can be only one rule to follow reasonably in choosing between different interpretations of a work of art. I wish to maintain that there are a variety of purposes with which one may approach a work of art, without falling outside the boundaries traditionally drawn for "aesthetic experience." Furthermore, for each dominant purpose, there is a reasonable or relevant rule of choice.

Consider, as example, a literary scholar whose special field is Elizabethan literature. In regarding the works of any Elizabethan author, he may well be interested primarily in understanding the author and his times. The understanding he seeks is not just that of propositional knowledge. He wants, so far as possible, to see things, as it were, through the eyes of the author. Imagination, as well as scholarship, is required. The rule which he will quite reasonably follow will be to accept that way of regarding the work which his scholarship leads him to believe comes closest to the author's. Thus, if he believes that there are wide discrepancies between the Olivier movie production of *Hamlet*, and the way the play was produced in Shakespeare's times, he will reject Ernest Jones' interpretation. The author's intention is again a standard in only an odd sense of "standard." Approxi-

mation to the author's reading is the criterion of my choice just because my purpose is to achieve this. For a man with another purpose, the choice may be reasonably made on another basis.

My next example, illustrating another purpose and rule, calls for care in description. Certain accounts here lead easily into the errors of Hedonism in its old form or in its current version in terms of "satisfaction of interests." Let me begin by making a distinction often blurred by aestheticians. It is one thing to like or enjoy a work of art, to prefer it to others of a similar sort, and quite another to rate it high in an order of aesthetic or artistic worth. Suppose that I am one of those for whom the outlook of the twice-born is a terrible bore. Presumably one of those contented with the first birth myself, I find the agonized searchings and ecstatic discoverings of the other tribe wearisome. In literature, I shall undoubtedly prefer a vision more relaxed and humorous. But, if I am at all objective, I will admit, though perhaps grudgingly, that the twice-born number among their ranks some of the best writers. *The best* I determine not by reference to my likes, but by reference to criteria of excellence, accepted as appropriate and relevant in rating the works in question. With this important distinction in mind, consider the case of a man who approaches a work of art with the primary purpose of getting, if possible, that special kind of enjoyment derived from works that accord with his own outlook. Note that if we say simply that what the man wants is to enjoy himself, have pleasure, or satisfy his interests, the first case is absorbed into the second. In fact the second will swallow up all cases, and we shall end with the ambiguous rule that I should choose that interpretation of a work which gives me the most satisfaction. To be sure, if I follow a rule relevant to my purpose, I shall ordinarily be satisfied. But both the reasons for and the nature of my satisfaction will differ in the different cases. To say that the test is my satisfaction is to waver between the truism of saying that I normally choose in accordance with my wants and purposes, and the untruism of saying that the second case is the archetypal one.

Let us now take a brief look at the second case in operation. Suppose that our man does not enjoy the sort of symbolic extension which many critics give to the poems of Frost. He will, then, read "After Apple-Picking" without the often adopted extension to thoughts of death. If told that Frost reads (interprets) the poem with the symbolic extension, he will not be moved by this fact. An extreme example of disregarding the author's intention for the sake of a certain sort of enjoyment is found in the parody productions of nineteenth-century melodramas.

The last case I shall consider (I do not claim the list to be exhaustive) is that in which my interest centers in aesthetic or artistic excellence. The relevant rule here would be to adopt that interpretation which does the best for the work, i.e., which results in the highest rating in the order of worth. There is one complication to consider and one danger to avoid in dealing with this third possibility. Let us skirt the danger first. If I recognize no criteria of excellence but coherence, and make a number of other mistakes, including the adoption of the view that the only thing that satisfies anyone is coherence, I shall end up with the single purpose, rule, standard of some forms of Idealism. But in practice, especially in judging literature, we employ a variety of criteria of excellence, and there can be boring unities as well as interesting ones. (I pass over here, as too long a story to embark on, the difficulties in the notion that we can order works of art in respect to their unity in much the same way that we can order physical objects in respect to their relative length, weight, or hardness.)

The complication in this last case arises from the following sort of circumstances. Suppose, following the rule in question, I regard a child's awkward attempt to sculpt doughnuts as a sophisticated study, in the Moore manner, of the human form. Provided that I am under no obligation to appraise the work, partly at least, on the basis of the skill of the artist, there is nothing wrong with my way of regarding it. If, however, I were a judge in a children's sculpture contest, some, but not all, of the relevant criteria of excellence would relate to skill. In the visual arts, skill occupies a much less important place among criteria of excellence than it did traditionally. But skill still counts to some extent. A hoax of some years ago will make the point plain as far as literature is concerned. An *avant-garde* magazine published a poem which had been composed by the method of random drawing of printed words cut from an unpoetical text. Our present conception of a work of art would, I believe, permit us to call the result of random word selection a "poem" and even a "good poem" if it satisfied certain criteria. In any case, there is no reason why one should not interpret the object and do so according to the unmodified third rule. But I doubt if any of us, knowing the circumstances of composition, would be prepared to award the producer a prize, should he enter his product in a poetry contest. Now, the concept of skill refers us back to the case of the singer and what was said there. To this we may add, truistically enough, that we cannot appraise the skill of a performer or producer without knowing what his objectives are. In

art, where new and unfamiliar forms appear from time to time, where often special training and sensitivities are required for an understanding of aims, fair appraisals of skill are often difficult, if not impossible, to make.

In summing up the import of the three rules considered, I should like to make it clear that I do not suppose that they can always be easily, simply, and unambiguously applied. Of course not. But they do represent, I believe, different bases for decision which fall within the traditional domain of the aesthetic.

How are these different rules related? There is no necessity that they should always yield the same or that they should always yield different results. An author's way of regarding his work may or may not be the one which makes me rate it more highly and like it better than do competing interpretations. However, the author's reading, where we can ascertain it, does achieve one or other or both of these results frequently enough to make him a privileged reader. Moreover, some understanding of his aim is, we have seen, essential to appraisals of his skill. Also, a reader may want, legitimately enough, to interpret and see the work in ways approximating the author's. The author is, then, neither *the* authoritative reader for all of us under all circumstances, nor a reader on a par with others. He should be neither set up as a standard, nor loftily dismissed as a piece of biographical irrelevance.

There remains a confusing ambiguity of "interpretation" to clear up. I do not have in mind the use of "interpretation" for both explanation and way of seeing. This amalgam of meanings is harmless enough. What I am concerned with is the philosopher's use of "interpretation" for both our ordinary understanding of words, sentences, allusions and for the way we explain and see a whole work of literature. Thus, a child reading "The dog runs after the cat" in his school book, and a psychoanalyst reading *Hamlet* as a dramatization of the Oedipus complex, are both "interpreting language." But their understanding, their getting the meaning, their reading, are pretty different things. In the child's case, there is something to conform to—customary usage; there is a correct and an incorrect reading or interpretation. Language is a public affair. While a man could invent a language which he alone uses, and write poems in it, this would be a senseless, if not insane, proceeding.

In the second kind of case, we have seen, there need be nothing to which we are obliged to conform. "Interpretation" in the second sense must, of course, conform to interpretation in the first sense in this way. It must "fit" the work to the extent of not requiring us to read the text incorrectly. The various in-

terpreters of *Hamlet* agree, on the whole, about the glossary of the play's Elizabethan terms and other such matters of lexicographical verification. It is this mixture of matters of verification with matters of choice in reading literature that has confused philosophers. It is easy to suppose that it is all one or all the other or at least, as I may have seemed to be saying, that the two are absolutely distinct. But things are neither simple nor neat here, and I wish now to blur a little the distinction I have made. The way in which we interpret (explain and see) a whole literary work may determine our understanding of words (e.g., where there are ambiguous words), of sentences (e.g., where ironic meanings are possible), or allusions (e.g., where there is a choice as to what part or aspect of a myth is relevant). One might add here that language conveys and suggests in all sorts of subtle ways, as well as having conventional meanings. Also, part of what a good poet does is to shift and change conventional meanings and to invent new ones. On the other hand, we are not free to interpret (explain and see) a work of literature in any way we please, because no one can make words mean anything he chooses.

How does the concept of intention relate to all this? Thinking of the stability of usage, we may, applying the concept of intention to the author's use of words, easily conclude that his intention is something to which we must conform. But, it should be noted, where actions are habitual or automatic we ordinarily do not apply the concept of intention. Much of our use of language is habitual or automatic. Thinking of this together with the public nature of language, we may be tempted to discard the author's intention as completely irrelevant. There is something to which we must conform, but this is "out there" in the poem. There are clearly other possibilities of confusion, but I shall not explore them here. Certainly, much more remains to be said not only on this, but on most of the other subjects touched on in this paper.

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THE AESTHETIC RELEVANCE OF ARTISTS' INTENTIONS[1]

LIKE most titles, this one is likely to prove misleading unless an initial disclaimer is made. In speaking of the aesthetic relevance of artists' intentions I want to come down rather lightly

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on the word "aesthetic." It is works of art that I want to discuss, and the cluster of questions concerning the relevance of intentions to their appraisal, appreciation, and interpretation.

There is one way of construing such questions which makes it very easy to dispose of them. If they are taken to concern the relevance of artists' intentions to appraisals and interpretations of *their* work, then it is apparent that such intentions are entirely relevant. What would it mean to speak of appraising your work, what it is that you have done or accomplished, apart from any consideration of what you are trying to do? The success or failure of your accomplishment depends upon the degree to which it fulfills your purpose; that is part of what is implied in calling it "your accomplishment." From such a standpoint, moreover, there is no important difference between appraising and appreciating. Both are estimates of your accomplishment, what it is that you have achieved. I cannot be said to appreciate your accomplishment if I totally ignore what you intended to do. The logic of appreciations of this sort leaves me no option in the matter. And for much the same reason I cannot ignore your intentions in trying to interpret what it is that you have accomplished. For the latter are part and parcel of the accomplishment, the thing achieved or done. You can't split off a man's intentions from what he has done in the way you can split off the branch from a tree. Change the intention and you change the act performed, the thing done or accomplished.

Evidently, then, we have something else in mind, if we are serious, in raising questions about the relevance of artists' intentions to appraisals, appreciations, and interpretations of the works they have produced. What this may be begins to come out when we substitute for "the artist's work" the phrase "work of art." I can ask, with some show of a point, what the relevance of your intentions may be to the appraisal of the works of art you have happened to produce. It is here, therefore, that we must make our beginning: What is the role of the expression "work of art" in talking about the products of human ingenuity and imagination?

Notice, first of all, that questions concerning the relevance of an artist's intentions to the appraisal or interpretation of something he has produced *as a work of art* strongly suggest that the artist himself is not responsible for the fact that his production is a work of art. As an accomplishment, the artist's work is his own; but he alone does not and can not make it a work of art. This is not to say that in calling something a work of art we do not normally presuppose that it is a human artifact. But this is not

what we are explicitly talking about when we refer to it as a work of art. Because of this, some aestheticians have supposed that the analysis of the expression "work of art" must be sought in the characteristics of the objects which we dignify by this title. And they have been mistaken. Like the term "happiness," the phrase "work of art" is not amenable to ordinary descriptive definitions, and the effects of so trying to define it are not what the definer may suppose: they do not clarify its use, but rather modify its range of application, and in so doing serve merely to redirect our attitudes toward the things to which the expression is subsequently applied. Moreover, the characteristics of the object to which we may point in giving reasons for calling it a work of art become reasons for so regarding it only because it is assumed that they help to make it worth contemplating in a certain way. Any feature of a work may provide a reason for speaking of it as a work of art, but only if that feature helps to make the whole of which it is a part something which is to be admired or appreciated for its own sake. It is for this reason that no particular symbolic form, no theme or subject-matter, no material or arrangement of materials, as such, can be definitive of what it is to be a work of art.

It is nevertheless possible to provide a characterization of the sort of thing that is being said when we call something a work of art. Works of art are so-called primarily because it is thought that when approached or handled in certain ways they tend to give satisfaction or pleasure to those who so handle them. But there is no one activity, no one way of approaching or handling works of art which is indispensable or which alone is appropriate to them all. Some aestheticians have tried to make such words as "contemplation" do the trick, and with disastrous results. Among other things, we contemplate pictures; but we read poetry, listen to music, witness plays, smell perfume, and taste fine wine or food. And when we do any of these things appreciatively and discriminatingly we are apt to call the things in question works of art. If we do not appreciate them, or if we find that our discriminations are not worth the candle, we resist any temptation to speak of them as works of art.

At this point it may be useful to compare the concept of a work of art with that of a tool. Both are what I sometimes call "functional concepts." By this I mean that they are used not to describe the physical attributes of things but rather to specify their roles in human life and the activities which are appropriate to them. A tool is an artifact that is used in certain characteristic ways to accomplish a certain kind of result, to get a certain sort

of thing done. Tools, in short, have certain appropriate, conventional uses; they are also subject to misuse and have improper uses. Now works of art, like tools, are subject to improper uses; and, although in a somewhat different sense than that which we have in mind in speaking of the misuse of a tool, they may be misused. Unlike tools, however, works of art, as such, are not used to accomplish a certain result or to get something done. There are certain things which it is proper to do with works of art; but these are not done for the sake of a result, but, as we say, for the pleasure or satisfaction of the doing. The result of doing what is appropriate to a work of art may be anything under the sun from emotional catharsis to wish fulfillment. But such results are accidental; they have nothing to do with the function of a work of art as such.

Before concluding these remarks, it is necessary to bring out more emphatically an aspect of the concept of a work of art which affects the nature of any controversy as to the relevance of an artist's intentions to the appraisal, appreciation, or interpretation of his art. The point is that "work of art" is an expression of commendation. This becomes obvious when we think of what is being said when a rainbow or any other natural object is called a work of art. A work of art is something which is admirable, which is worthy of admiration, and which, perhaps, ought to be admired. This being so, any denial of the relevance of the artist's intentions to what he has accomplished as a work of art is bound to have the force of a prescription which enjoins us to disallow any consideration of such intentions in attempting to give reasons why it is worthy of admiration. Such denials, in short, do not so much state a fact as modify the ways in which we approach or handle the objects we are prepared to call works of art; they limit the scope of the considerations we may take into account in judging, appreciating, and interpreting, and in so doing profoundly affect our entire conception of what our artistic activities ought to be or become. This is why the debate over questions of the sort with which we have here to do is bound to be intense and acrimonious, and why any appeal to the "facts" concerning the character of the objects themselves or concerning our actual transactions with such objects is likely to be inconclusive. Nor do I deny that in trying to spell out some of the proprieties governing our discourse about works of art, I myself am at the same time protecting the activities of which such discourse is a part. Forms of words, it has been said, reflect forms of life. In characterizing, with approval, the logical amenities that govern the use of a form of words, I am doing something more than describing them; I am

also reënforcing the modes of behavior to which the forms of words belong.

It is time, now, to turn to other matters. We cannot successfully understand the cluster of questions with which we are concerned without some preliminary discussion of the concepts of appraisal, appreciation, and interpretation as these are employed in talking about works of art.

To appraise a work of art, plainly, is to judge it, to estimate its worth. It must be borne in mind, however, that the things we call works of art are not merely such, that they often have other functions and interest us for other reasons. It is therefore essential to distinguish appraisals of pictures, musical compositions, or literary productions which judge them as works of art from those which estimate them from the standpoint of some other role or capacity. Our concern, here, is only with the former. It should be observed, also, that appraisals of works of art as such are properly and reasonably made only after the completion of other acts which are performed in dealing with works of art as such. Such acts, which would include reading, listening, witnessing, contemplating, and the like, may conveniently be called the "primary" or "aesthetic" activities required in dealing with works of art. Among such acts we would not include acts of judgment or appraisal; the latter are secondary, dependent acts which are performed subsequently to and in consequence of reading, listening, witnessing, and contemplating. You can't appreciate a piece of music as a work of art if you won't listen to it; but you can appreciate it without judging it; nor is it essential to the proper handling of any work of art that it be judged. But what we find when we perform the primary acts called for by a work of art provides the basis for a proper performance of such secondary acts as judging. How we appraise a work of art as such depends upon our appreciation of it and upon the performance of the primary acts upon which appreciation itself depends. Any reasons we may adduce for highly appraising a work of art which are not based upon what is found in performance of the primary activities are irrelevant to our appraisal or else, if we persist in them, transform the appraisal into a judgment which is not concerned with the object as a work of art.

The term "appreciate" is equivocal. In one sense, as we have seen, its meaning is like that of "appraise." But there is another important sense of the term which must be contrasted with this. When we speak of art appreciation or of appreciating a work of art as such, we are talking not about estimations and judgments, but rather about pleasurable or satisfying discrimination. In this

sense, my capacity for appreciation is not my power to appraise but my sensitivity, my ability to discriminate and to be moved by the qualities of the work as a work of art. To appreciate a man's work, as we have seen, it is necessary to take into account his intentions; but it is not necessary, even though it may be desirable, to have regard to an artist's intentions in appreciating his product as a work of art. The question, here, concerns the fullness of our appreciation, not appreciation as such. In order to adequately appreciate a work of art, to discriminate and relate its qualities, to discern its full expressive content, one may have to consider the artist's intentions. But the latter, by the nature of the case, can have no authoritative claim upon us as appreciators or upon the subsequent judgments we may make as appreciators.

The term "interpretation" is used with abominable looseness by critics and philosophers of art. Sometimes, apparently, it is used in a way which seems to refer to the primary activities of reading, listening, and contemplating. I should regard this as a misuse of the expression. More properly it is employed to refer to the activities of a critic in paraphrasing, describing, explaining, explicating, analysing, and the like. In this sense, interpretation is clearly an ancillary activity, undertaken in order to accomplish something beyond itself. How great is the confusion latent in this equivocation becomes evident when we observe how different are the primary activities of looking or contemplating from those of explaining or explicating, and how different are their relations to the work of art itself. In effect, interpretations are tools for the use of an audience in readying itself for the activities involved in appreciation. But the appreciative reading of a poem is not a tool and is not undertaken to get something done; it does not ready us for something else and its adequacy is not judged by its effects.

The role of interpretation, then, is advisory. It serves to guide, direct, and in general to improve the facility with which the primary acts which are proper to works of art are performed. Interpretations of works of art are properly judged on this basis. But just as we frequently do other things, often very well, without advice or counsel, so on occasion we may appreciate a work of art very fully without the help of an interpretation, or without interpreting it at all. Interpretations are useful or necessary precisely because not everything in most works of art is immediately perceivable, and we resort to them, as a rule, because we fail to understand what we read or see or because its relevance to other things in the work is not adequately appreciated.

Interpretation and judgment obviously are not the same thing,

any more than interpretation and appreciation are the same thing. Judgment presupposes appreciation; it does not presuppose interpretation. It is usually assumed, however, and with some basis, that appraisals that are based upon interpretation are sounder than those that are not. The reason for this is that interpretations are presumed to enable the artist's audience to gain a more adequate appreciation of the qualities of his art. But in speaking of appraisals as "based" upon interpretations it is possible to be misleading, precisely because of the equivocation mentioned above. In the sense here under consideration, the appraisal of a work of art is only indirectly based upon interpretation; it is directly based only upon what we find in performing the primary acts proper to appreciation of a work of art. The relevance of any interpretation of a work of art, in short, is always through appreciation. It is only as it affects appreciation, through the modification of what we see, hear, or feel, that any interpretation provides a basis for and is relevant to the judgment of a work of art as such.

All interpretations of a work of art are bound to be selective and are bound to be slanted toward a certain mode of appreciation. And because in most cases alternative modes of appreciation are possible, there can be, as a rule, no such thing as a definitive interpretation. The aesthetic relevance of a particular interpretation, therefore, can be established only with respect to a certain mode of appreciation, a certain way of approaching and handling the work of art. We cannot just say that the thing as interpreted is "there" and have done. In speaking of a particular work of art, we are not talking about something that has a certain single definitive shape or pattern. Actually any particular work of art includes a considerable variety of such patterns which cannot all be appreciated in a single reading or view of the work. Each such pattern, moreover, answers to a particular mode of appreciation which is possible only if the work is approached and handled in a certain way. Nor is any one of these patterns the only objective one, the one that is constitutive of the work as it is "in reality." For this reason, any prolonged debate over what is there in the work itself is bound to be futile; and it will be so, in many cases, not just because our individual experiences of a work are not the same, but because the work itself is capable of a number of modes of appreciation, one of which, in principle, may be as proper to it as another.

This inescapable and innocuous relativity of interpretations does not, however, preclude the possibility of saying that one interpretation is more adequate than another. The adequacy of any

interpretation may be judged in at least two ways, according either to the adequacy with which it prepares us for a particular mode of appreciation or else to the comparative satisfactoriness of the mode of appreciation to which it leads. The question concerning the aesthetic relevance of an interpretation, therefore, is likely to be somewhat complicated. Nor can it be properly answered without regard to the complexities which unavoidably enter into our conception of a particular work of art.

A few words must now be said about the use of the word "intention." Here, also, much avoidable trouble has resulted from the failure to distinguish carefully among the several senses in which aestheticians and critics employ the word. In speaking of an artist's intentions, some writers appear to be thinking of the ends or goals for which the artist may undertake his work. Frequently, however, this is confused with what the artist intends to say or do in some part of the work. Manifestly, what I intend to accomplish in saying something is not the same thing as what I mean when I say it. And what answers to questions about the former does not at all answer to questions concerning the latter. Unfortunately, there are also other and different notions that are frequently introduced when questions concerning an artist's intentions are raised, which have to do neither with questions of ends nor with questions of what the artist intended to say or do in the work, but rather with the attitudes, conscious or otherwise, which cause him to choose his subject-matter or which condition his selection of themes, genres, or materials and determine the way in which he handles them. Such attitudes, so to say, affect the "personality" of the work of art as a whole, and our awareness of them is likely to affect our own view of it when we approach the work as appreciators and as interpreters.

It should be abundantly clear, by this time, that to raise questions as to the relevance of an artist's intentions to the appraisal, appreciation, and interpretation of works of art that he has produced is to raise a series of questions of very different sorts. In the remaining space I can merely indicate some of the considerations that are involved in trying to answer a few of them.

It is evident from what has already been said that in any of the above-mentioned senses, artists' intentions do not provide a standard for judging their productions as works of art. The only intrinsic standard afforded those who profess to judge the merits of works of art as such is the satisfaction that results when we engage in the primary activities that are proper to particular works. But it is too easily concluded from this that an artist's intentions are of no use to a potential judge. For by taking account of an

artist's intentions we are frequently able to avoid the serious mistake of solemnly judging as works of art productions whose only interest, either to the artist or to ourselves, lies elsewhere. Properly regarded, artists' intentions are advisory: they help us to know what to expect and hence how to approach a particular artifact. They do not provide the criterion from which a work is to be judged as a work of art; but they are of help in deciding whether such a criterion is to be invoked in judging a work. This, I think, is their primary relevance, and no confusion of values or fallacy is involved in acknowledging the fact. Quite the contrary.

From the standpoint of appreciation, it is of the first importance not to confuse the various things which philosophers tend to lump together under the heading of "intentions." Consider, first, the artist's ulterior goals. Now as Hume long ago pointed out, one of the sources of our appreciation in contemplating a work of art is our awareness of the fitness of the work to the end for which it was produced. This functional beauty of a work of art can only be appreciated, however, if the artist's ulterior intentions are understood and borne in mind. Many works of art, of course, have no such interest; my only point in mentioning it is to show that you can't say out of hand that an artist's ulterior aims are irrelevant to the appreciation of his art. It depends upon the character of the individual work, upon the central focus of its artistic interest.

The same is true, although in another way, of the relevance of an artist's attitudes, the factors we lump together under the heading of his "personality." Now it is certainly possible to appreciate many works of art, some of them quite fully, without regard to the attitudes which, consciously or unconsciuously, the artist may express in them. But works of art differ enormously with respect to the central focus of their interest. Some works are virtually anonymous; nothing is added to our interest from the knowledge of their authors' characters. Others are intensely personal. I have found, for example, that when I read the novels of Dickens or Dostoyevski with some awareness of their authors' personalities much becomes clear that I could not previously understand or appreciate. The very dramatic dimension of their art is measurably intensified thereby, and the whole takes on a new dimension of significance it did not have before. The result is not a distraction from what the author himself tells us, but rather an amplification of what he says or does, or, better, an amplification of what his work conveys to us as we read it. In short, a considerable part of our interest in many works of art arises from the fact that they express to us in a poignant and affecting way re-

current patterns of human behavior whose independent interest to us is funded into the artistic transaction which transpires as we read or look or listen.

It will doubtless be replied that when an artist's attitudes are relevant to the appreciation of his work as art they will be manifest to us in the act of appreciation so that it is unnecessary to go outside the work for additional information. And it will be urged that, if we have to go outside the work to discover what it may express, the work itself is *ipso facto* deficient as a work of art. I should reply, however, that just as no man is an island, so no work of art is an island, and that the integrity of a work of art, like the integrity of a person, is quite compatible with this fact. The phrase "going outside the work" is a treacherous one, responsible for no end of confusion and misconception as to the nature of works of art and the process whereby they are appreciated. For example, everyone knows that it is possible to go outside what one initially or immediately perceives in a work and yet not "read into" it something which is not there. Everyone knows also that it is frequently necessary to go outside the work as it immediately presents itself in order to gain access to its underlying meanings and depth values. The only serious question, therefore, is whether, having gone outside, what we find when we return is more meaningful, more satisfying, more moving. If so, then what we have "read into" the work as a consequence is "really" there in the only sense in which, in the present context, such a question has any interest.

We have still to consider the relevance of an artist's intentions in the more limited sense which has to do with what he means to say or do *in* the work of art. Now it will be argued, no doubt, that although such intentions may be relevant if our concern is to measure his achievement, they have no bearing upon the appreciation of the work of art as such. In one sense, I agree. I agree also that in the sense now being considered, an artist's intentions, unlike his motives or attitudes, do not comprise a distinguishable expressive or functional aspect of the work. If what the poet meant or intended to say does not finally coincide with what the work itself means it is irrelevant to the work and to our appreciation of it.

These banalities, however, have frequently misled aestheticians into the mistaken conclusion that consideration of an artist's intentions is irrelevant to the *interpretation* of his work. When I read a great work of art with full appreciation, the farthest thing from my mind is what he may have intended to say or what he means in a particular passage or by a particular allusion or figure of speech. The fact is, however, that full appreciation rarely oc-

curs, and that with most complex works of art repeated study, with the aid of dictionaries, glossaries, mythologies, foot-notes, and God knows what else, is necessary in order to place oneself in a position to perform successfully the primary acts required for the appreciation of a given work. In short, most works of art have to be interpreted, and it is because of this that consideration of what an artist intended to say or do in a work becomes relevant, although indirectly, to appreciation and to appraisal.

Just as we are all guilty, at one time or another, of the "one and only one meaning fallacy" so we are guilty of the fallacy of "fixed meaning." Words have meanings; they also acquire them. And for the purpose of understanding the subtle nuance, overtone, or association which may explain a poet's use of a given word or figure we have to go outside what the dictionary is able to tell us. We must go somewhere. In ordinary discourse we make allowances for a person's intentions in construing what he has said. In the case of works of literary art we need not make allowances, but we are simply foolish not to accept any clue, however we may gain access to it, which will enable us to read a passage as intelligently as the work as a whole requires. Every interpretation, in one sense, goes outside the work as we immediately find it. This being so, it is of no importance whatever how an interpretation is come by, so long as the advice it gives us for the purpose of reading appreciatively actually serves that purpose. Whether the artist himself is in a privileged position to know what his work means I do not care. I care only that knowledge of his intentions sometimes enables me to construe a passage I could not otherwise adequately comprehend, and that when I follow such directions as he may give me for reading, looking, or listening, I commonly read, look, or listen in a way which is more satisfying.

There is nothing mysterious about the artists' intentions, as some theorists have argued. They are not private entities to which no one else can gain access. With artists as with less gifted folk, access to their intentions is gained in dozens of ways, from explicit, although by no means infallible, statements of intentions, from titles, stage directions, and other such paraphernalia. We gain such knowledge, frequently, by examining other works of the artist himself or other works in the style, idiom, or tradition of the work under consideration. We gain it also from the internal evidence afforded by other parts of the particular work. All this we sift and fit together as best we can into the most coherent, most satisfactory interpretation of which we, with the artist's help, are capable.

The point is that we approach the interpretation of works of art

not as omniscient observers who can always distinguish what an artist means from what he says, and who know in advance what is relevant or irrelevant. We consider an artist's intentions because we have questions about his work that we cannot always answer without his guidance, without knowledge of what he was trying to do or say. And we arrive at our interpretations not by gaping at the "work itself," but by a complex process of trial and error involving many things besides looking at the work. Anyone who has sought to interpret a work belonging to a culture other than his own knows how true this is.

As I have found from the examination of a great many pieces of criticism, references to the artist's intentions usually do not and are not meant to go outside the work. Nor do they in the least indicate that the critic who uses them is not interested in the work as a work of art or that he has been overcome by preoccupations with history or biography. On the contrary, in most cases, they are references to what, as the critic believes, is "really there," and are introduced only in order to provide us with the means to a fuller, more adequate appreciation. The function of critical references to an artist's intentions, nine times out of ten, is simply to go behind immediate appearances to underlying artistic realities that we otherwise stand no chance of appreciating. They do not take us away from the work, but, rather, bring us in the end closer to it. They do not divert attention from the "aesthetic object" but provide the opportunity to appreciate what is really there. And if, overwhelmed by the noisy cries of "fallacy" and "heresy" that surround us, we refuse to make use of them, the consequence will not be a purification of our aesthetic experience of art, but merely an impoverishment of our resources for having such experience—if there is any such thing.

HENRY DAVID AIKEN

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BOOK REVIEWS

An Introduction to Deductive Logic. HUGUES LEBLANC. New York: John Wiley & Sons; London: Chapman & Hall [1955]. xii, 244 p. $4.75.

This textbook presents the statement calculus and the first-order predicate calculus, "sentential logic" and "quantificational logic." Formalization is not introduced until Chapter Three, and in Chapters One and Two (sententially and quantificationally) valid schemata are presented, and sample deductions are carried out

with these schemata. At several important crossroads the book indicates alternative methods as well as its preference for one of them. The logic of classes and relations is connected to the predicate calculus, and an introduction to "syntax" deals with the consistency, completeness, and decidability of the systems presented.

The book maintains throughout high standards of exactitude and precision, and, for the alert and attentive student, of clarity. Difficulties related to the use and mention of symbols are aptly overcome in the presentation. At some places, the writing could be slightly less succinct. For instance, when meta-axioms are introduced for quantificational logic (page 140), it is not explicitly stated how to obtain an axiom from a meta-axiom. The procedure is clear if one remembers what the dummies used in the meta-axioms are, but a few words would help the student. In fact, an explicit statement would properly belong to the rules of deduction.

The relation between the informal section (the first two chapters) and the formal presentation of systems may raise some questions. At times one has the feeling that these two chapters, instead of being an informal introduction to the systems subsequently presented, are already quite formalized, and moreover in a direction which is not exactly the one that is afterwards followed. For example, a rule of Adjunction is introduced, but later becomes unnecessary because of the rule of Detachment and the theorem $p \supset (q \supset p.q)$.

On the whole, the book is one of the best presentations in print of the topics it covers.

JOHN VAN HEIJENOORT

NEW YORK UNIVERSITY

La pensée religieuse du jeune Hegel; liberté et aliénation. PAUL ASVELD. Louvain: Publications Universitaires de Louvain; Paris: Desclée de Brouwer, 1953. ix, 244 p. (Bibliothèque philosophique de Louvain, 11.) 135 fr. b. ($2.70).

This monograph, bearing *Imprimatur,* is a well documented and very helpful handbook for the development of Hegel's religious thought prior to the Jena period. It begins with his earliest years in Stuttgart and follows him through Tübingen and Berne, ending with Frankfort and the *Fragment* of 1800. The author's aim is two-fold (p. 9): on the one hand, he seeks to provide the French reader with a thorough account of his subject, and, on the other, he hopes to make a contribution "de la *Hegelforschung überhaupt.*" And it is no disparagement of the good qualities of the work to say that the former aim is much more

obviously accomplished than the latter. The fact is that the book contains virtually nothing new (although it does contain something of the views of the most recent existentialists), but is most valuable as a heavily documented account of the views held by well-known commentators from Haym and Dilthey to Wahl and Hyppolite.

As a means of carrying out his second aim, Asveld proposes two concepts, *liberté* (*d'être chez lui*) and *aliénation* (*d'esclavage*), which are to be taken as recurrent themes throughout Hegel's philosophy. This suggests a systematic treatment which is not actually forthcoming; Asveld is most direct in revealing his own views at the times when he is criticizing Häring or when he rejects the hopelessly biased Marxist interpretation of Lukacs. It is important, however, that the author has an extended acquaintance with and concern for religious ideas, since no commentator can do justice to Hegel's early writings who does not understand the theological problems they raise.

The book commences with a brief survey of the main position adopted by each of the standard commentators who have treated the early Hegel, Dilthey, Häring, Steinbüchel, Glockner, Neil, and Lukacs. Throughout the entire work the author makes good use of other important works such as those of Haym, Rosenkranz, Rosenzweig, Lasson, and Hoffmeister. There is scarcely a writer of importance neglected, with the exception of Kroner (in his Introduction to the English translation of the *Jugendschriften*) and the excellent little book by Gray, *Hegel's Hellenic Ideal.*

In order to provide a background, Asveld sketches in briefly the religious situation of the preceding century with special attention to the Enlightenment and to the religious ideas of Kant and Fichte. For this historical material the work of Hirsch, *Geschichte der neueren evangelischen Theologie,* and Barth's *Die protestantische Theologie im 19. Jahrhundert* are the main sources. Asveld aims at clarifying the climate of opinion prevalent in the *Tübingerstift* where Hegel studied from 1788–93. This section is exceptionally well documented and cites, in addition to the above, the writings of Troeltsch, Gass, and Stephan.

The author seems to have been impressed by the genetic, expository method of Häring (*Hegel, Sein Wollen und Sein Werk*), and he uses the fragments of Nohl (*Hegels theologische Jugendschriften,* 1907) and Hoffmeister (*Dokumente zu Hegels Entwicklung,* 1936), correlating them with the respective periods in Hegel's life. The longest discussion (pp. 118–213) is given over to the Frankfurt period, which includes, in addition to the Schelling correspondence of 1794–5 and scattered fragments in Nohl, "The Spirit of Christianity and its Fate" as well as the much discussed

"Frankfurter Systemfragment" (or, as Häring would have us add, the "so-called" *Systemfragment*).

Of all writers on Hegel, Häring has made the deepest impression upon the author. He agrees with some of his conclusions, but dissents sharply from him over the question of the "personality" of God in Hegel; Asveld believes that the young Hegel lost the personality of God by dissolving it into personal relations between the divine and human spirits. Moreover, Asveld thinks that Häring over-emphasized the importance of the Bible for Hegel and that Hegel often attached his own meanings to Biblical language.

The whole work is insufficiently a systematic treatment to permit extended discussion; its strength is historical and expository. Of special importance are the following: the good brief discussion of Schelling's *Philosophische Briefe* (pp. 96 ff.), a French translation of the famous *Eleusis* poem written to Hölderlin, and some parts from five letters between Schelling and Hegel (1794–95) translated into French from Hoffmeister's edition of Hegel's *Briefe*.

The general conclusion (pp. 214–35) contains some very good points, but it is entirely too much influenced by what current French existentialists have found, or thought they have found, in the young Hegel. Hegel may certainly be regarded as the father of a great deal in modern thought, but I very much doubt that we should try to add to it the current "I-Thou" strain in theology.

JOHN E. SMITH

YALE UNIVERSITY

Fragen und Aufgaben der Ontologie. HERMANN KRINGS. Tübingen: Max Niemeyer Verlag, 1954. viii, 256 pp. DM 22.—.

Metaphysik. WALTER EHRLICH. Tübingen: Max Niemeyer Varlag, 1955. 128 pp. DM. 10.—.

It is a pity that the reviewing of foreign books has become such an accidental affair in our day. Authors whose books get known through reviews abroad are as likely as not to be unheard of in their own country or, if known, not cherished. Surely the only purpose in reviewing foreign books in philosophy is to enlighten readers on the current state of philosophizing in the country in question. But so long as the choice of which books shall be reviewed is left to the whims of publishers who may or may not care to make arrangements for the distribution of review copies abroad, it is hard indeed for students of philosophy to obtain any clear picture of the state of philosophical speculation abroad.

In regard to Germany, at least, it may be said that American philosophical publications reviewed in their journals reveal a similar absence of any criterion of the important. But there is a difference. In Germany it is again possible to publish pretentious nonsense in larger quantities than in the U. S., where publishers are notoriously concerned with the volume of sale. Consequently it is more important for us to give attention to avoiding unrepresentative and unimportant books in order to make time and space available for the comparatively few valuable works German thinkers are producing. Only if more careful choice is made can American philosophers expect to find any guide through the review media for profitable reading in contemporary German philosophy.

By the application of any very rigorous criterion neither of the above titles would receive attention in foreign journals. They are uninspired, private ventures in thinking, called forth by the current German preoccupation with ontology and metaphysics and the striving for novelty at all costs in these traditional disciplines. Though neither author would profess allegiance to Existentialism, their choice of problems and their terminology reveal its ever-present influence. One of the unfortunate by-products of this philosophical direction has been to encourage an esoteric vocabulary, free invention of new words, and personal idiosyncrasies in expression of every conceivable sort. These works abound in Existentialist jargon and the simplest ideas are expounded in abstruse and complicated fashion.

Nevertheless, there is considerable difference between them. Krings' book is helpful in its historical sections, particularly in the first chapter where the author attempts to distinguish the various senses in which ontology and metaphysics have been used by recent German philosophers who have been influenced by phenomenology. The question of the constitutive ground of existent things, he rightly holds, is different from the question of what being itself is, and one ought not to use the same title to cover both investigations, as is commonly done. "Ontology asks: what is the individual thing according to its essense, how does it exist, what is the ground or grounds of its individual being; whereas the other question inquires why there is anything existent at all and what the meaning of that 'is' may be which is first used without distinction to refer to the individual thing as well as to its ground." For this latter question the title metaphysics ought to be used, according to Krings, and he goes on accordingly to discuss these distinctions in the work of Husserl, Hartmann, Heidegger, Conrad-

Martius, and others. So long as he is so engaged, his book is moderately enlightening.

But Krings is interested in developing an ontology of his own, one which takes as a model the Heideggerian attempt at uncovering the nature of being by a phenomenological analysis of psychological experience. Krings holds that genuine ontological thinking is a kind of catharsis, a purification of the spirit rather than the desire for knowledge. Hence his fundamental category becomes *Lauterkeit* (purity), which leads the individual thinker to the deeper mysteries of reality. Purity must not be taken in its everyday ethical significance, which conceals and covers up its ontological significance. For purity is essentially a relation between essence and existence (used apparently in their traditional significance). This relation is one of enduring tension, a conflict which is never resolved, but which can enlighten and transform the individual who reaches the ontological level in his pursuit of truth.

After this curious mixture of psychological and logical categories, the author goes on to sketch historically the loss and recovery of this ontological purity. To be sure, he insists that his account is not to be taken as empirical history. In other words he claims to be describing a movement of being itself, not an accidental development in the history of Western experience. The reader gets, however, a fairly conventional discussion of the various kinds of catharsis and the relation of the "demonic" as the most radical form of the loss of purity to Krings' conception of being. The whole is a fairly evident imitation of Heidegger and his peculiar habits of philosophizing, unfortunately without any of Heidegger's flashes of genius. As a consequence it appears arbitrary in the highest degree, confusing in its mixing of ideas that belong in different disciplines, and finally boring beyond measure, as only pretense to wisdom can be.

Walter Ehrlich's book is shorter and presumably a continuation of eight other works of his which have appeared since 1927, of which this reviewer can profess no knowledge. Ehrlich makes no historical references to speak of and his thinking has few referents in traditional Western metaphysics. He certainly does not adopt Krings' definition of the subject matter of metaphysics. Apparently he has studied the religions of India, for he proceeds to make his own use of some familiar concepts of Hinduism, at the same time inventing new terms with an Indian sound. Ehrlich does not hesitate to bring in discussions of the latest discoveries in mathematical physics and explicates the nature of space and time by reference to Indian mysticism in the same breath as he

speaks of gravitation and mathematical space. In fact he brings in everything before he is finished, a potpourri calculated to give intellectual indigestion to any reader who would take much of it seriously.

Such works as these are apparently with us always, an inseparable element of civilization and culture. It is probably an illusion to imagine that there are more of them today than formerly and perhaps more in Germany than other countries. They must have readers, one assumes, and it can be an interesting exercise to imagine the state of mind of anyone who would study a book like *Metaphysik*. Those readers who value clarity and careful reasoning in metaphysics will do well to shun it like the plague.

J. GLENN GRAY

COLORADO COLLEGE

The Philosophy of William Ellery Channing. ROBERT LEET PATTERSON. New York: Bookman Associates [1952]. 298 pp. $4.50.

In this volume by Professor Patterson of Duke University we have the first systematic and detailed study of the William Ellery Channing as a philosophical theologian. After expounding, as background for his treatment of Channing, the Calvinism and Lockeanism of the environment into which Channing was born in 1780, Patterson develops the theology of Channing under the traditional heads of "God," "Man," "Christ," "Reason and Revelation, Nature and Grace," and "Salvation." Patterson rightly holds that Channing's unitarianism was not merely a negative "anti-trinitarianism" and that, therefore, Channing was not a typical representative of the Unitarianism of his day. The author's welcome and wholesome aversion to the irrational obscurantism of much twentieth-century theology shines through and heightens his appreciation of the lucid and rational spirituality of Channing. Since, however, all theological rationality sounds similar, Patterson soon finds that the Channing he presents is uncomfortably Thomistic. He is therefore forced to a careful and convincing discrimination of the two rationalities.

In his positive suggestion that Channing's thought is akin to personalism, Mr. Patterson seems to me less successful, unless the term be stretched to include all varieties of idealism, in which case it becomes useless as a descriptive name for a particular pattern of idealistic philosophizing. Channing undoubtedly should be described as an idealist; what adjective should be added to characterize his thought more precisely seems to me still open to question.

I do not, for example, find any mention in Patterson's book of either Schelling or Coleridge; yet Channing's conception of the nature and office of reason strikes me as closer to that of Schelling and his English interpreter than to that of any other philosopher. My questions have to do with the superstructure of Mr. Patterson's book. The foundation is well and truly laid and he has made a valuable contribution to American intellectual history.

JOSEPH L. BLAU

COLUMBIA UNIVERSITY

Frederick Augustus Rauch—American Hegelian. HOWARD J. B. ZIEGLER. With a Foreword by Lee M. Erdman. Lancaster, Pa.: Franklin and Marshall College, 1953. xvii, 103 p. (Franklin and Marshall College Studies, No. Eight.)

Professor Ziegler of Lehigh University, in this monographic study of the life and thought of the German-American educator and philosopher, Frederick A. Rauch, has made a significant contribution to the study of Hegelianism in America. He has shown conclusively that at the very time when European theologians (e.g., Kierkegaard) had found that there was a fundamental incompatibility between the thought of Hegel and Christianity, American thinkers were beginning to consider Hegelianism as a solid basis for the philosophic defense of Christianity. For, as Ziegler shows, Rauch was both a devout Christian and a warm Hegelian; and his major work, the *Psychology* of 1840, was welcomed "enthusiastically" by reviewers in American theological journals. What the author could not and therefore did not attempt to prove was that Rauch was in any sense an original or important interpreter of Hegelian thought. In fact, it can be said that the ultimate effect of Ziegler's work is to destroy the legendary image of Rauch as a philosopher in the wilderness and to leave as our image of the real Rauch a fine teacher and an inspiring educational and theological leader.

JOSEPH L. BLAU

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The Last Essays of Georges Bernanos. Translated by Joan and Barry Ulanov. Chicago: Henry Regnery Company [1955]. vi, 263 pp. $4.50.

Before his death in 1948, Georges Bernanos planned to put into book form the lectures he had delivered during the course of the two preceding years. Three of these lectures are here published as they were written: "Revolution and Liberty," "The European Spirit and the World of Machines," "Our Friends the Saints."

Two other selections, "France Before the World of Tomorrow" and "Why Freedom?" have been pieced together by the editor of the French edition of Bernanos' Essays. Included also is an appendix of Bernanos' informal "Asides to the Audience" which preceded his lectures.

Bernanos' intention in these talks was to provoke and compel his audience to think seriously about some very important problems. As "essays" in the literal sense these are attacks on intellectual complacency.

One central theme runs through this book. This is the evil of modern "machine civilization." Technology, here called "technological barbarism," is viewed as a power spreading over the world, uncontrolled, independent of genuine human interests, and capable of self-multiplication. The world thus being shaped is like "a gigantic mechanical factory which must be regulated like a clock." With the growth of the monster, technology (sometimes Bernanos calls it "science"), the human spirit withers. Man becomes "a sort of industrious insect." The barbaric machine, fitted to function among conditions of least resistance and at maximum efficiency, results in the totalitarian state. Each stage of technological development is taken at the expense of human liberty and freedom. The appropriate symbol, for Bernanos, of the dangers of technology, is the atom bomb. The corresponding spiritual "anemia" of our time is utter indifference to both truth and falsehood. The weakened spirit mechanically responds to propaganda, one part of the giant machine.

All of this has come about through the "de-Christianization of Europe." Here the story becomes at best vague. Technological barbarism was not born on French soil, Bernanos writes (pp. 45–46):

> It was the cotton merchants of Manchester who produced machine civilization with the first machines to weave cotton, not knowing what they were doing, and while they were doing it they also produced the British Empire. . . . Machines made money, money made other machines and the infernal circle was thus closed. It wasn't until about a half-century later that materialistic civilization found its philosophical justification in Marx and Hegel—in German thought, not French thought.

It was the "intellectuals," sceptical, enlightened, perhaps scientific, who did the rest of the damage. Intellectuals were behind Liberalism which, for Bernanos, effected the conception of the economic man and the virtues of technology, leading directly into Marxism, Communism, and Fascism. Our one hope lies in a general revitalizing of the human spirit. The Christian concept of original sin, rejected by so many intellectuals, is necessary to an

adequate sense of the dignity of man. In this task of revitalization the church (Catholic) "has a great role to play." Bernanos sees something most significant in the fact that "the Catholic Church has already condemned the modern world." We may also think "of the Church as a vast transport company, carrying passengers to Paradise . . ." with the saints directing the traffic.

The problem of modern technological power, unguided by intelligent planning and therefore failing in large part to serve as a liberal and liberating instrument of common human concerns, is a serious one. But it is not a new problem. Bernanos does his own keen wit an injustice in treating what he has to say as novel, and in assuring his audience that he is both radical and prophetic in delivering this message. If there is general agreement that a problem exists, there is far from that on what the solution is to be. Even among that minority of the world's population committed to Christian doctrine there appears to be considerable doubt as to exactly what is the role of the church in this world and why it has not yet been played. In the absence of any attempt by Barnanos to suggest an adequate solution to the problem that exists, or to even examine what would now be meant by a "Christianization of Europe," one wonders what the role of the Christian intellectual has been, and is, in the advance of technological barbarism. Might not the machine-giant thrive on ineffectual protests and solutions? For these will always serve as deceptive comforts, as semblances of intelligent inquiry, and thus as illusions of liberty and freedom. Something more positive, certainly more penetrating, is required than parochial "hope" and Sunday School piety. The machine, after all, like the devil, may have a use for scripture.

The virtues of this book do not lie in its discussion of the main theme. They are rather to be found in the wit, in the passionate sincerity, and in the asides and vivid thrusts which characterize Bernanos' vigorous and clear articulation of the threat that faces modern man and his culture.

H. S. THAYER

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of the Secretary of the Association, The Catholic University of America [1955]. 313 p. $3.50.

BRAITHWAITE, R. B.: *Theory of Games as a Tool for the Moral Philosopher.* An Inaugural Lecture Delivered in Cambridge on 2 December 1954. Cambridge: At the University Press; [New York: Cambridge Univ. Press] 1955. 76 p. $1.25.

BRIDGMAN, P. W.: *Reflections of a Physicist.* [2d ed., with ten papers added.] New York: Philosophical Library [1955]. xiv, 576 p. $6.00.

BURKE, EDMUND: *Reflections on the Revolution in France.* Ed. with an Introd. by Thomas H. D. Mahoney, with an Analysis of the *Reflections* by Oskar Piest. New York: Liberal Arts Press [1955]. xliv, 307 p. (The Library of Liberal Arts, No. 46.) Cloth, $2.75; Paper, $1.25.

CONFERENCE ON SCIENCE, PHILOSOPHY AND RELIGION. *Symbols and Society.* Fourteenth Symposium of the Conference on Science, Philosophy and Religion, ed. by Lyman Bryson, Louis Finkelstein, Hudson Hoagland, R. M. MacIver. New York & London: Pub. by the Conference, distributed by Harper, 1955. xi, 611 p. $6.00.

GRINDEL, REV. CARL W., ed.: *Concept of Freedom.* Chicago: Henry Regnery [1955]. xii, 512 p. $10.00.

HIMELHOCH, JEROME, and FAVA, SYLVIA FLEIS, eds.: *Sexual Behavior in American Society; an Appraisal of the First Two Kinsey Reports.* Ed. for the Society for the Study of Social Problems. New York: W. W. Norton [1955]. xvii, 446 p. $5.00.

KROPOTKIN, PETR: *Mutual Aid, a Factor of Evolution.* With a Foreword by Ashley Montagu and "The Struggle for Existence" by Thomas H. Huxley. Boston: Extending Horizons Books [1955]. xix, 362 p. Cloth, $3.00; Paper, $2.00.

LAMPRECHT, STERLING P.: *Our Philosophical Traditions; a Brief History of Philosophy in Western Civilization.* New York: Appleton-Century-Crofts [1955]. xi, 523 p. (The Century Philosophy Series.) $5.50.

MARCUSE, HERBERT: *Eros and Civilization; a Philosophical Inquiry into Freud.* Boston: Beacon Press [1955]. xii, 277 p. $3.95.

MAURIAC, FRANÇOIS: *Words of Faith.* [Tr. from the Original French *Paroles Catholiques* by Rev. Edward H. Flannery.] New York: Philosophical Library [1955]. 118 p. $2.75.

MONSARRAT, K. W.: *On Human Thinking.* London: Methuen [1955]. 155 p. 15 s.

MORRIS, CHARLES: *Signs, Language, and Behavior.* New York: George Braziller, 1955 [copyright 1946]. xii, 365 p. $3.75.

NEEDHAM, JOSEPH, ed.: *Science, Religion & Reality.* Introductory Essay by George Sarton. New York: George Braziller, 1955. 355 p. $3.95. (First ed. 1925.)

PI SUÑER, AUGUST: *Classics of Biology.* Authorized English Translation by Charles M. Stern. New York: Philosophical Library [1955]. x, 337 p. $7.50.

PIEPER, JOSEF: *Justice.* Tr. by Lawrence E. Lynch. [New York:] Pantheon Books [1955]. 121 p. $2.75.

RICE, PHILIP BLAIR: *On the Knowledge of Good and Evil.* New York: Random House [1955]. 299 p. $4.50.

ROBINSON, DANIEL S.: *Crucial Issues in Philosophy; Studies of Current Problems and Leading Philosophers from the Standpoint of Philosophical Idealism.* Boston: Christopher Pub. House [1955]. 285 p. $5.00.

STACE, W. T.: *The Philosophy of Hegel; a Systematic Exposition.* [New York:] Dover Publications [1955]. x, 526 p. Cloth, $3.95; Paper, $1.98.

THOMSON, SIR GODFREY: *A Modern Philosophy of Education.* [Third Impression.] London: Allen & Unwin [1954]; [New York: Barnes & Noble, 1955]. 283 p. $2.75.

THONNARD, F.-J., A.A.: *A Short History of Philosophy.* Tr. from the revised and corrected edition by Edward A. Maziarz, C.PP.S. Paris, New York [etc.]: Society of St. John the Evangelist, Desclée & Cie, 1955. x, 1074 p. $6.50.

VIVANTE, LEONE: *A Philosophy of Potentiality.* London: Routledge & Kegan Paul [1955]. 115 p. 14 s.

JOURNAL OF THE HISTORY OF IDEAS. Vol. XVI, No. 2, April 1955. *Ronald Hepburn:* George Hakewill: The Virility of Nature. *Jerome Rosenthal:* Voltaire's Philosophy of History. *Martin Albaum:* The Moral Defenses of the Physiocrats'Laissez-Faire. *G. B. Mathur:* Hume and Kant in Their Relation to the Pragmatic Movement. *E. W. Strong:* William Whewell and John Stuart Mill: Their Controversy about Scientific Knowledge. *Philip Spencer:* "Barbarian Assault": The Fortunes of a Phrase. *Arthur F. Beringause:* The Presentness of the Past in Ireland. *G. L. Anderson:* Charles Gildon's Total Academy. *Daniel H. Kruger:* Hobson, Lenin and Schumpeter on Imperialism.—Vol. XVI, No. 3, June 1955. *Arthur B. Ferguson:* Renaissance Realism in the "Commonwealth" Literature of Early Tudor England. *Kenneth McCrae:* Ramist Tend-

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PHILOSOPHY OF SCIENCE. Vol. 22, No. 3, July 1955. *Arthur W. Burks:* Dispositional Statements. *Haig Khatchadourian:* Some Metaphysical Presuppositions of Science. *Edward G. Ballard:* On the Nature and Use of Dialectic. *Wesley C. Salmon:* The Short Run. *Francis Seaman:* Whitehead and Relativity. *Herbert A. Simon:* Prediction and Hindsight as Confirmatory Evidence.

THE REVIEW OF METAPHYSICS. Vol. IX, No. 1, Sept. 1955. *Frederic B. Fitch:* The Reality of Propositions. *Nathaniel Lawrence:* Causality, Will and Time. *Newton P. Stallknecht, Francis C. Wade, S. J., William Earle:* Freedom and Existence: A Symposium. Colloquium No. 7: Theses on Presuppositions, by Darid Harrah, with comments by Alan Ross Anderson, Monroe Beardsley, Richard Rorty, Abner Shimony, Frederick Sontag, Francis V. Raab. *George Nakhnikian:* Plato's Theory of Sensation, I. *Robert Palter:* On the Significance of Space-Time.

NOTES AND NEWS

Professor Paul Bernays of Switzerland will be Visiting Professor in Philosophy at the University of Pennsylvania for the spring term of 1956. He will teach a course on axiomatic set theory and a course in advanced logic.

Professor Theodore M. Greene began his thirty-fifth year of college teaching this fall as the first incumbent of the Hartley Burr Alexander Chair of Humanities at Scripps College in Claremont, California.

The Josiah Royce Centenary was commemorated at Emory University, Decatur, Georgia, in the Chapel of the Candler School of Theology on November 17, 1955. Sponsors were the Georgia Philosophical Society and the Foundation for Idealistic Philosophy. The program was as follows.

Leroy E. Loemker, Presiding.
Paul E. Pfuetze, "Remarks on the Josiah Royce Centenary."
James P. Craft, "Remininscences—Royce as I Knew Him."
J. Harry Cotton, "Josiah Royce Centenary Address."
Open Forum discussion.

Fellowships with stipend of $2000 to $4000 will be awarded for 1956–57 to candidates for the doctorate in the Program in American Studies at the University of Minnesota. Applicants must hold a degree or degrees in one of the humanities, in one of the social sciences, or in American civilization.

No services will be required of fellows; they will devote their entire time to study and research. In determining the stipend of each fellow, the committee of award will consider such factors as the extent of his graduate study and his financial obligations.

Applications close *March 1, 1956;* awards will be announced *April 15, 1956.*

There will be available to fellows and other graduate students not only the curriculum provided by the Program in American Studies and the participating departments in the social sciences and the humanities, but additional resources supported by a grant from the Carnegie Corporation of New York. These include visiting professors and special courses during the regular academic year and both summer terms, lectures and concerts, and a faculty research seminar in American civilization.

Additional information and forms for applying for fellowships may be had from the Program in American Studies, University of Minnesota, Minneapolis 14, Minnesota.